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Marine Review

THE BUSINESS OF TRANSPORTATION BY WATER

NEW YORK

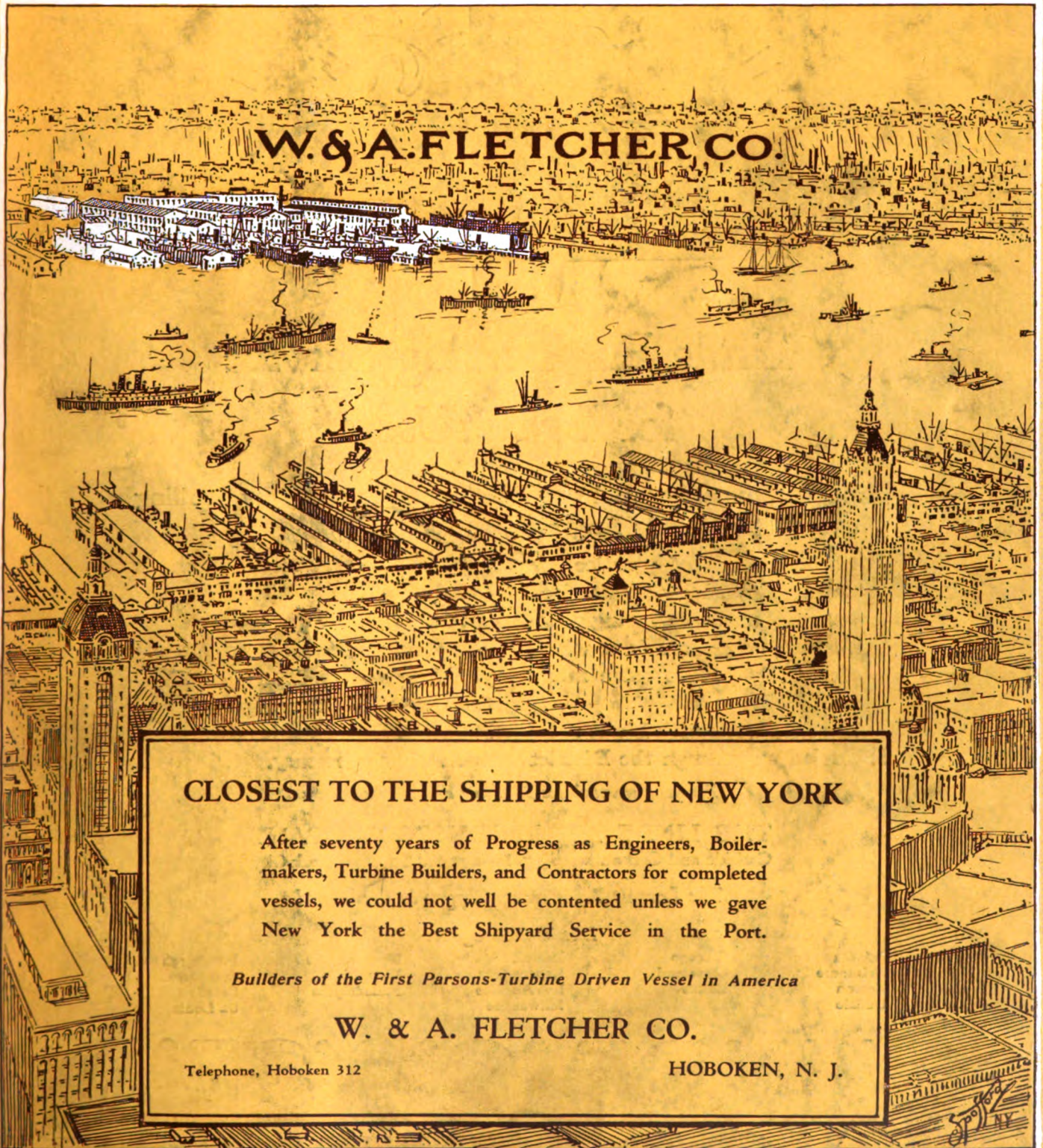
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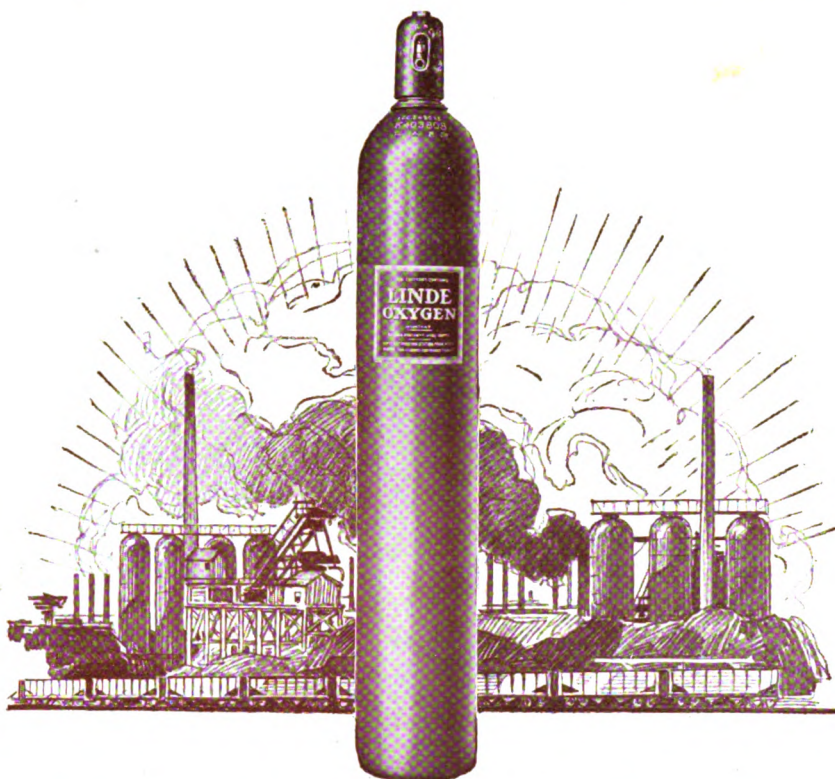
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Against the judgment of traffic experts, the shipping board wants to spend \$15,000,000 on refitting this old German liner AGAMEMNON and two similar ships.

Shipping Board Should Quit

BY R. V. SAWHILL,
Editor, Marine Review

PURSUIT of a rainbow is a profitable profession compared with the job of waiting for the shipping board to help American shipping. Any marine executive who has any faith in the board is shutting his eyes to simple facts proved by the board's own history. From its organization, this new federal agency has been a barrier to the country's marine industry.

Pass over its war record, when members were appointed and resigned with the rapidity of a revolving shutter, but remember its actions since the armistice. Construction work to win the war was pursued years after peace was signed, with the result that the supply of vessels depressed the market to one of the lowest points in history. Would not the shipbuilders as well as the owners have been better off today if construction had been stopped on Armistice Day?

Then the board disregarded cost and wasted public funds in forcing its ships into service. Many inexperienced men with no intention of staying in the business were given ships on a basis by which they had no responsibility except to draw their fee. And then the board was busy determining a few more policies about sales methods and prices. Some sincere buyers were forced to pay outrageously high prices and all went into bankruptcy when the freight boom blew up. Again, would not the entire marine industry have been better off if the board had sold all of its ships which the active market would have absorbed, and then scrapped the undesirables?

The new board recognized a depression and withdrew many of its vessels and got rid of some expensive operating contracts, helping the industry to a limited degree. But now the present board is back at the old

game. Advice is asked from the marine leaders and then all are promptly told that the advice will not be followed. Instead the board continues to draft notices of its intention some day to find a policy. The latest is a threat of active government operation unless the market absorbs all of the board's present trade routes, with a service guarantee attached which every marine leader agrees makes the purchase impossible to finance.

Possibly the board is serious about government ownership, although the President's record as a friend of the American merchant marine stands opposed to any socialistic plan. The announcement may be intended to enliven the sales market and enhance the price. That is equally indefensible as haggling over sales price is outrageous when the crying need of the industry is for the complete removal of the board.

The merchant marine will begin its real growth on the day the shipping board relinquishes all pretense of meddling in a private industry.

* * *

CHAIRMAN LASKER got back to Washington after his 5-week Florida vacation and the machinery was going to start up at full speed ahead. He was so busy shaping definite policies that he gave up some of his regular conferences. But the second day home, he took a half day off to play golf on request from the White House. Since Mr. Lasker could give real help in getting the board out of its policy of meddling in business, his vacations are costly. If the board loses only the \$50,000,000 a year which it admits, the wastage each working day is \$166,666, each hour is \$20,833, each minute \$347 and each second \$6. Taxpayers will agree that golf is expensive.

Why British Ships Are Kept Busy

Shipowners Have Won Control of Producing, Trading, Banking
and Insuring Enterprises—Real Keynote of British Success

FROM a list of men prominent in British shipping affairs, twenty-five names recently were selected for the purpose of tracing and studying their connections in other branches of British commerce and industry. The names are given in Table I. A survey of their business activities shows that these 25 men—as might be expected—are members of boards of directors of 48 steamship companies trading in all parts of the world. But what is more significant to an American, anxious to unearth the secret of the success of the British merchant marine, is that these leaders of British shipping also are directors of 128 other companies, including the 4 principal railroad corporations, 20 banks and trust companies, 24 insurance companies, 36 mercantile and trading concerns, and 44 manufacturing and industrial establishments.

Without going any further, it is evident from this simple statement that British shipping lines are not isolated threads of communication competing for business with all comers, but are an integral part of the fabric of British commerce and production. Each of the great British steamship companies obtains large volumes of traffic through its intimate affiliations with other lines of business. In other words, the British merchant marine has been built up on the principle that it is not sufficient merely to furnish adequate facilities for handling passengers and freight, but that in addition connections of a solid character must be established with traffic-producing industries and enterprises.

This control of the sources of traffic is effected by an unusually complete system of interlocking directors. Judging from this experience, it follows almost as simply as in a geometrical proposition that American shipping will become powerful when, and not until, it also establishes powerful connections in the world of commerce, finance and production, thus linking itself with the great traffic-producing branches of American business. It is of course recognized that the American merchant marine is handicapped in developing proper traffic connections by the Sherman antitrust act and the generally cavilling attitude of congress toward important business

enterprises. The Edge act, which permits of a certain amount of combination for foreign trade purposes, offers some relief but by no means permits the thorough interlocking of mutual interests which has been developed in Great Britain under conditions where



Photo—Elliott & Fry, London
LORD INCHEAPE—A GIANT AMONG BRITISH SHIPOWNERS

As chairman of the P. & O. line he is constantly at work building up new traffic connections for British ships in the Far East.

private enterprise is untrammelled. Nevertheless, much can be learned from a study of the closely interwoven connections of British shipping, and it is for the purpose of facilitating such an examination by the managers of American steamship companies and others engaged in foreign trade that this article is presented.

The interlocking connections which will now be detailed of course represent only a small fraction of the complete picture, it being manifestly impossible within brief limits to present a comprehensive survey of the connections of British shipping with other lines of industry in all its thousands of minute ramifications. The few connections which it is now proposed to trace are, however, typical of the whole and they illustrate how firmly grounded is British shipping in the warp and woof of the business and economic life of the United Kingdom.

The 25 men whose names are pre-

sented in Table I are believed to be representative. They are not necessarily the most prominent men in British shipping, and it should be emphasized that almost any other names which might be selected from the hundreds of directors of British shipping enterprises would serve almost equally well.

A few of the men listed in Table I have unusually extensive connections. The 25 taken together are, as previously pointed out, directors of 48 British steamship companies, these companies being listed in Table II. The serial numbers placed before the names in Table I correspond with similar numbers in the succeeding tables, thus showing through just what agencies the interlocking of interests has been effected.

For instance, Viscount Pirrie, who is chairman of Harland & Wolff, shipbuilders, Belfast, and whose name appears with the serial number 2 in Table I, is seen to be a director of the following corporations:

Steamship companies: Coast Lines, Ltd.; Elder, Dempster & Co.; Union Castle Mail Steamship Co.; African Steamship Co.; Atlantic Transport Co.; British & North Atlantic Steam Navigation Co.; British & Irish Steam Packet Co.; Frederick Leyland & Co.; Glen Line; Laird Line; Ocean Transport Co.; Oceanic Steam Navigation Co.; (White Star Line); Pacific Steam Navigation Co.; and G. & J. Burns.

Railroad companies: The Southern Railway Co.

Banks and Trust companies: London Joint City & Midland Bank; Alliance Debuture Corp.

Mercantile and Trading concerns: Eastern Telegraph Co.; James Moss & Co.

Industrial companies: David & William Henderson; British-Mexican Petroleum Co.; British Union Oil Co.; Burmeister & Wain Oil Engine Co.; Harland & Wolff; David Colville & Sons, Ltd.; John Brown & Co.; London & Glasgow Engineering & Iron Shipbuilding Co.

It will be noted that Lord Pirrie does not appear to be director of any insurance companies; but on the other hand the Pacific Steam Navigation Co., of which he is a director, is in turn a subsidiary of the Royal Mail Steam Packet Co., of which Lord Kyslant is chairman, the latter in turn being a director of at least two prominent insurance companies, Elders Insurance Co. and the London Maritime Insurance Co., as well as of numerous other

corporations. This instance is cited merely to show the maze of indirect connections which has been woven into the British shipping industry.

These various semidirect connections can be traced almost to an unlimited extent. For instance, in addition to controlling the Pacific Steam Navigation Co. just mentioned, the Royal Mail Steam Packet Co., with an issued capital of £11,300,000, also controls the Nelson Steam Navigation Co.; the Nelson Line (Liverpool Ltd.); MacAndrews & Co. Ltd.; the Royal Mail Steam Packet Meat Transport Ltd.; and in addition holds large interests in the Union Castle Mail Steamship Co.; Elder, Dempster & Co.; Lamport & Holt, Ltd.; and the Argentine Navigation Co., Ltd. While space forbids mention of other connections in detail, many of which can be traced out through the accompanying tables, one or two others are worthy of special consideration.

Lord Inchcape, who has been given the serial number 9 in Table I, has



Photo—Elliott & Fry, London

SIR OWEN PHILIPPS NOW LORD KYSLANT

Chairman of the Royal Mail Steam Packet Co., and a director of many other companies—He was made a baron early this year in recognition of work as a developer of empire trade.

been unusually active in consolidating the connections of the British merchant marine in the Far East, particularly through the agency of the semi-official Peninsular & Oriental Steam Navigation Co., of which he is chairman. This company, which has the rather modest capital of £6,500,000, since 1910 has acquired control of the following steamship organizations:

British India Steam Navigation Co., Ltd.; Union Steamship Co. of New

Zealand, Ltd.; Blue Anchor Line, Ltd.; New Zealand Shipping Co., Ltd.; Hain Steamship Co., Ltd.; Merchantile Steamship Co., Ltd.; Orient Steam

Table I

THE MEN

- 1—Sir Owen Philipps, now Lord Kyslant.
- 2—Viscount Pirrie.
- 3—Sir Vincent Calliard.
- 4—Viscount Churchill.
- 5—W. Heward Bell.
- 6—Algernon H. Mills.
- 7—Sir Aubrey Brocklebank.
- 8—Lord Glanely.
- 9—Lord Inchcape.
- 10—J. Francis Mason.
- 11—J. Bruce Ismay.
- 12—Sir Thomas Royden.
- 13—Sir Edwin F. Stockton.
- 14—G. R. T. Taylor.
- 15—Sir Thomas Williams.
- 16—Sir John Field Beale.
- 17—Sir Alan Garrett Anderson.
- 18—Charles Booth.
- 19—Sir Hugh Bell.
- 20—Oswald Sanderson.
- 21—Rupert E. Beckett.
- 22—Walter B. Gair.
- 23—Edwin A. Beazley.
- 24—Eric B. Butler Henderson.
- 25—Sir Charles E. Hambro.

Navigation Co., Ltd.; Khedivial Mail Steamship & Graving Dock Co., Ltd.; General Steam Navigation Co., Ltd.

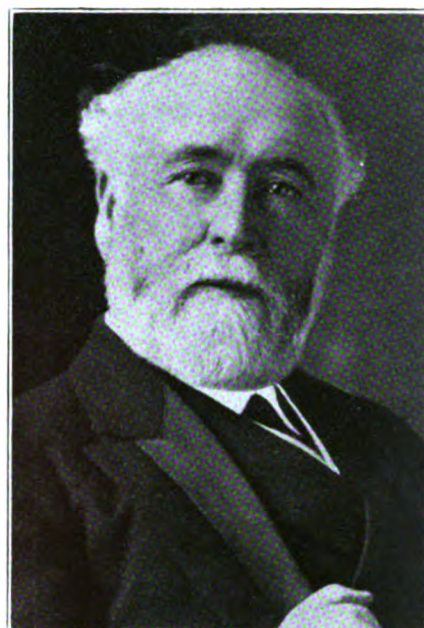
Director of Traffic Feeders

In addition, Lord Inchcape is chairman and managing director of the Australasian United Steam Navigation

Table II

THE STEAMSHIP COMPANIES

- 1—MacAndrews & Co., Ltd.
- 1—John Hall & Co.
- 1—Argentine Navigation Co.
- 1, 2—Coast Lines, Ltd.
- 1, 2—Elder Dempster & Co.
- 1—James Moss & Co.
- 1—King Line.
- 1, 2—Lamport & Holt.
- 1—Royal Mail Steam Packet Co.
- 1, 2—Union Castle Mail Steamship Co.
- 2—African Steamship Co.
- 2—Atlantic Transport Co.
- 2—British and North Atlantic Navigation Co.
- 2—British & Irish Steam Packet Co.
- 2—Frederick Leyland & Co.
- 2—Glen Line.
- 2—Laird Line.
- 2—Ocean Transport Co.
- 2, 11—Oceanic Steam Navigation Co. (White Star Line).
- 2—Pacific Steam Navigation Co.
- 2—G. & J. Burns.
- 3—Canada Steamship Lines.
- 5—Nixon's Navigation Co.
- 7, 12—Anchor Line.
- 7, 12—Cunard Steamship Co.
- 8—Dulverton Steamship Co.
- 8, 20—Shipping Federation, Ltd.
- 8—Tatem Steam Navigation Co.
- 9—Australasian United Steam Navigation Co.
- 9—Eastern & Australian Steamship Co.
- 9—Peninsular & Oriental Navigation Co.
- 9, 16, 17—Anderson, Green & Co. (Managers of the Orient Steam Navigation Co.).
- 9—Mason & Barry, Ltd. (Portugal).
- 11—Asiatic Steam Navigation Co.
- 12—American Levant Steamship Co.
- 12—Commonwealth & Dominion Line.
- 12—Thomas Royden & Sons.
- 12—Santa Clara Steamship Co.
- 7, 12—Thos. & Jno. Brocklebank, Ltd.
- 18—Booth & Co. (London), Ltd.
- 18—Booth Steamship Co.
- 19, 20—Wilsons & North Eastern Railway Shipping Co.



Photo—Elliott & Fry, London

LORD PIRRIE OF BELFAST

A man who builds ships, runs them and controls traffic feeding organizations.

Co., Ltd.; and chairman of the Eastern & Australian Steamship Co., Ltd., two organizations which are not corporately connected with the P. & O. line but are naturally not antagonistic to it. It is especially interesting to note that Lord Inchcape is also a director of nearly a dozen mercantile and trading companies of a character likely to be especially useful to a steamship organization trading in the Far East. Among these companies are the Central Queensland Meat Export Co.; D'Arcy Exploration Co.; Doodputlee Tea Co.; Salomon Tea Co.; Binney & Co.; Bullard Bros. & Co.; Burns Philip & Co.; and the Steamship Owners' Coal Association.

It is interesting and unusually significant also to note that this gentleman is a prominent director of the two telegraph companies which have a virtual monopoly of the cable and telegraph services between Europe and the Far East, namely, the Eastern Telegraph Co., with a capital of £7,000,000, and the Eastern Extension, Australasia & China Telegraph Co., with a capital of £4,000,000.

The foregoing by no means exhausts Lord Inchcape's services to British shipping. He is director of the Great Western Railway Co., one of the four systems into which all the railroads of Great Britain have been grouped. He is a director of the National Provincial & Union Bank of England, one of the so-called "Big Five" banks which through their thousands of branches virtually control the banking business of the United Kingdom, with numerous



Photo—Elliott & Fry, London

LORD GLANELY

Prominent as a director in British shipping, marine insurance and industrial companies.

subsidiary banks in foreign countries. Lord Inchcape is also director of the P. & O. Banking Corp., the Royal Bank of Scotland, and the Corporation of Foreign Bond Holders. In the insurance field he is connected with the Atlas Insurance Co., Marine Insurance Co., and the Tanker Insurance Co. In the production and manufacturing field he is a director of the Anglo-Persian Oil Co., Scottish Oils Ltd., and other corporations.

From the standpoint of a middle western congressman, these numerous interlocking connections probably would be considered sinister. That they are nothing of the sort every business man knows, as he also knows that it is only through such integrated control that modern industry can be conducted, under suitable safeguards and supervision. At any rate the British merchant marine owes its success as much to its strong connections with traffic-producing organizations as to anything else. It should be noted especially in the examples cited above how the steamship companies concerned are intimately associated, through interlocking directorships, with financial and insurance corporations as well as with traffic-controlling organizations and even with development companies which may produce traffic in the future, such as the D'Arcy Exploration Co., or the Alto-Parana Development Co. of which E. B. Henderson of the Sheffield & South Yorkshire Navigation Co. is a director.

It may be worth while to trace one or two further connections of special

interest to Anglo-American trade. Lord Pirrie and J. Bruce Ismay are directors of the Oceanic Steam Navigation Co., otherwise known as the White Star Line, which is in turn part of an American corporation, the International Mercantile Marine Co. of

Table III**RAILROAD COMPANIES**

- 1, 2, 3—The Southern Railway Co.
- 4, 5, 6, 7, 8, 9, 10—Great Western Railway Co.
- 11, 12, 13, 14, 15, 16, 17, 18—London Midland & Scottish Railway Co.
- 19, 20, 21, 22, 23, 24, 25—London & North Eastern Railway Co.

New Jersey, with a capital of \$120,000,000, controlling, besides the White Star Line, the Red Star Line, the Atlantic Transport Co., the International Navigation Co., Frederick Leyland & Co., Richards Mills & Co., Ismay, Imrie & Co., and others.

Some of Lord Pirrie's connections already have been traced. J. Bruce Ismay, in addition to his affiliations with the International Mercantile Marine, is a director of the Asiatic Steam Navigation Co.; the London, Midland & Scottish Railway Co.; Liv-

Table IV**BANKS AND TRUST COMPANIES**

- 17—Bank of England.
- 9—National Provincial & Union Bank of England.
- 21—Westminster Bank, Ltd.
- 1—Bank of British West Africa.
- 2, 12—London Joint City & Midland Bank.
- 20—Lloyd's Bank, Ltd.
- 4—British Overseas Bank.
- 6—National Bank of Egypt.
- 6—Glyn, Mills, Currie & Co.
- 6, 21—Yorkshire Penny Bank, Ltd.
- 7, 18—Bank of Liverpool & Martins.
- 9—P. & O. Banking Corporation.
- 9—Royal Bank of Scotland.
- 25—Hambro's Bank, Ltd.
- 3—British Trade Corporation.
- 3—Trust & Loan Co. of Canada.
- 9—Corporation of Foreign Bond Holders.
- 2, 12—Alliance Debenture Corporation.
- 25—Investment Corporation of Canada.
- British Steamship Investment Trust, Ltd.

erpool & London & Globe Insurance Co.; Delta Insurance Co.; Sea Insurance Co.; Liverpool & London Steamship Protection association, and other corporations.

Besides the foregoing, the International Mercantile Marine, through its London advisory committee, of which Sir Vincent Calliard is a member, is linked up with the Canada Steamship Lines, Ltd., with \$24,000,000 capital; Furness, Withy & Co., freight steamship owners; Vickers, Ltd., of which Sir Vincent is chairman; Metropolitan Vickers Electrical Co.; Wolseley Motors, Ltd.; World Auxiliary In-

surance Co.; British Trading Corp.; Trust & Loan Co. of Canada; and the Southern Railway Co. of Great Britain.

The foregoing shows that at least one American steamship organization has succeeded in properly establishing itself in the world international commerce. But from the American standpoint it is not wholly fortunate that these connections have necessarily been formed through British affiliations and through English corporations which are not subjected to the congressional harrying to which American shipping organizations must submit.

Another name in Table I is that of Sir Thomas Royden, chairman of the Cunard Steam Ship Co., and of the Anchor Line. Sir Thomas is also a director of the American-Levant Steamship Co.; the Commonwealth Dominion Line; the Santa Clara Steamship Co.; and Thos. & John Brocklebank, Ltd., all of which are closely affiliated with the Cunard Steam Ship Co. Through the boards of these various companies we also find connections with the Anchor-Brocklebank Line; Anchor-Donaldson, Ltd.; Booth Line; Booth Steamship Co., and others.

Outside the steamship fields, Sir Thomas Royden appears as a director of the London, Midland & Scottish Railway; Alliance Debenture Corp.; Union Marine Insurance Co.; Anglo-French Middle East Development Corp.; British-Mexican Petroleum Co.; British Union Oil Co.; Cyprus Asbestos Co.; Pacific Oilfields, etc., all of which affiliations naturally are servicable to the Cunard Steam Ship Co. and its related transport organizations.

The connections of a sufficient number of individuals have now been

Table V**INSURANCE COMPANIES**

- 1—Elders Insurance Co.
- 1—London Maritime Insurance Co.
- 20—North British & Mercantile Insurance Co.
- 3—World Auxiliary Insurance Co.
- 6—Sun Insurance Office.
- 7, 11—Liverpool & London & Globe Insurance Co.
- 8—West of England Protection & Indemnity association.
- 9—Atlas Assurance Co.
- 9—Marine Insurance Co.
- 9—Tanker Insurance Co.
- 22—Commercial Union Assurance association.
- 11—Delta Insurance Co.
- 11—Liverpool & London Steamship Protection association.
- 11—Liverpool & London War Risks association.
- 11, 23—Sea Insurance Co.
- 12—Northern Maritime Insurance Co.
- 22—Union Marine Insurance Co.
- 16—Legal Insurance Co.
- 16, 17—Orient Underwriting Fund Ltd.
- 16—Royal Insurance Co.
- 19—Yorkshire Insurance Co.
- 20—Hull Mutual Steamship Protection Co.
- 20—Hull Underwriters' association.
- 25—Royal Exchange Assurance Corp.

Table VI

MERCANTILE AND TRADING CONCERNS

- 9—Central Queensland Meat Export Co.
- 9—D'Arcy Exploration Co.
- 9—Doodputlee Tea Co.
- 9—Salonan Tea Co.
- 9—Binny & Co.
- 9—Bullard Bros. & Co.
- 9—Burns Philip & Co.
- 12—Anglo-French Middle East Development Corp.
- 16—Sir Jacob Behrens & Sons.
- 18—Alfred Booth & Co., Ltd.
- 24—Alto-Parana Development Co.
- 24—Tecka (Argentine) Land Co., Ltd.
- 25—British Baltic Commercial Corporation.
- 1—London & Thameshaven Oil Wharves.
- 1—Suez Canal Co.
- 2, 9—Eastern Telegraph Co.
- 9—Eastern Extension, Australasia & China Telegraph Co.
- 2—James Moss & Co.
- 4—Grand Junction Canal Co.
- 8—Atlantic Shipping & Trading Co.
- 8—British Corporation for Survey & Registry of Shipping.
- 8—Coal & Shipping Exchange of Cardiff, Wales.
- 9—Steamship Owners' Coal association.
- 13—Manchester chamber of commerce.
- 13—Manchester Ship Canal Co.
- 14—Trafford Park Estates.
- 15—Birmingham Canal Navigations.
- 18—Iquitos Harbour, Ltd.
- 18—Manaos Harbour, Ltd.
- 20—Humber Conservancy.
- 20—Lloyd's Register of Shipping.
- 20—National Maritime Board.
- 21—Airs & Calder Navigation Co. (Canals).
- 23—Gracey, Beazley & Co. (Ship Brokers).
- 24—Chile Telephone Co.
- 14—Port of Queensborough Development Co.

indicated to show in some detail how closely the interests of British shipping are interlocked with all other business and industrial enterprises in the United Kingdom, including its railroads, banks, trust companies, insurance companies, trading companies, development organizations, productive associations and manufacturing corporations. These affiliations as viewed from the group standpoint will now be considered briefly.

It is essential of course for a steamship organization to have close connections with railroad companies because nearly all of the freight which moves by sea also travels a portion of its journey by rail. It is not surprising, therefore, to find the British steamship enterprises closely connected with the railroads of the United Kingdom.

Recently all the railroad companies in Great Britain were amalgamated into four great systems: The Southern railway, Great Western railway, London Midland & Scottish railway, and the London & North Eastern railway. These new consolidated railroad companies have four boards of directors with an aggregate membership of about 100. All of the 25 British shipping leaders mentioned in Table I are directors of one or the other of these four great railway systems. It is clearly evident that the

connection between British shipping and British railroading is a direct and solid one. The fact that British railway rates are not uniform as between different shippers and not rigidly controlled as in the United States, makes the relationship between the British merchant marine and the English railroad companies all the more useful.

Nor do the leaders of British shipping confine their railroad connections to their own country; they are found as directors of railroad enterprises all over the world and chiefly in those centers where British shipping is strong, such as China, South America,



Photo—Elliott & Fry, London

SIR THOMAS ROYDEN

As chairman of the Cunard Steamship Co., he helps to link this great transport agency with traffic producing companies in America, Europe and elsewhere.

South Africa, British India, Australasia, etc.

In the face of these interlocking connections, the necessity for the struggle waged by the United States shipping board in 1921 to secure a portion of the Egyptian cotton traffic to the United States becomes apparent. The real wonder is that this conflict was not more serious. By virtue of its maze of connections all over the world, the British merchant marine has made it exceedingly difficult for competing steamship organizations to get a foothold, especially so in the Far East.

Plenty of Banking Aid

In developing foreign trade as well as for the construction of steamships and the maintenance of steamship organizations, banks and investment houses are a fundamental necessity.

Banks indeed have been described as furnishing the underpinning of foreign trade. It is logical, therefore, that the 25 steamship directors selected for this investigation are also directors of 14 banks and six investment houses. These establishments are headed by the Bank of England, of which Sir Alan Garrett Anderson of the Orient Steamship Navigation Co. is a director. The other leading joint-stock banks in England also are included together with various banking and trust companies in the Far East and North America.

Special mention should be made of the British Overseas Bank and the British Trading Corp. listed in Table IV. The former, which was organized in 1919 with an authorized capital of £5,000,000 controls the Anglo-South-American bank; the Dominion bank; the Imperial Ottoman bank; the Northern Banking Co.; Glynn Mills Currie & Co.; Charles Hoare & Co.; Union Bank of Scotland; and William Deacon's bank.

The British Trading Corp. was in—
(Concluded on Page 200)

Table VII

MANUFACTURERS AND PRODUCING COMPANIES

- 2—David & William Henderson.
- 2, 12—British-Mexican Petroleum Co.
- 2, 12—British Union Oil Co.
- 2—Burmeister & Wain Oil Engine Co.
- 2—Harland & Wolff.
- 2—David Colville & Sons, Ltd.
- 2—John Brown & Co.
- 2—London & Glasgow Engineering & Iron Shipbuilding Co.
- 3—Beyer Peacock & Co.
- 3—Metropolitan Vickers Electrical Co.
- 3, 14—Metropolitan Railway Carriage, Wagon & Finance Co.
- 3—Vickers, Ltd.
- 3—Wolsley Motors, Ltd.
- 7—Liverpool Nitrate Co.
- 8—Barry Graving Dock & Engineering Co.
- 8—Bute Shipbuilding Engineering & Drydocks Co.
- 8—Cardiff Channel Drydocks & Pontoon Co.
- 8—Mercantile & Pontoon Co.
- 8—Ropner Shipbuilding & Repairing Co.
- 8—Tredgar Drydock & Wharf Co.
- 9—Anglo-Persian Oil Co.
- 9—Scottish Oils, Ltd.
- 19—Dorman, Long & Co.
- 19—Sir B. Samuelson & Co.
- 12—Cyprus Asbestos Co.
- 12—Pacific Oilfields.
- 14—Taylor Bros. & Co.
- 14—A. B. C. Coupler & Engineering Co.
- 15—Gloucester Railway Carriage & Wagon Co.
- 16—British Cellulose & Chemical Mfg. Co.
- 16—Guest Keen & Nettlefolds.
- 16—John Lysaght, Ltd.
- 16—Orconera Iron Ore Co.
- 19—Bell Bros., Ltd.
- 19—Brunner Mond & Co., Ltd.
- 19—Carlton Iron Co.
- 19—Channel Steel Co.
- 19—Horden Collieries.
- 19—North Eastern Steel Co.
- 19—Synthetic Ammonia & Nitrates Co.
- 20—Earle's Shipbuilding & Engineering Co.
- 24—Banbury Ironstone Co.
- 24—Coking Co.
- 24—Agricultural Industries, Ltd.

Dry Laws Benefit U. S. Ships on Pacific

Herbert N. Thomas, general passenger agent of the China Mail Steamship Co., recently told of that line's experience with the dry laws. According to Mr. Thomas, business has been won away from the wet lines since the advent of the shipping board vessels. The average Pacific coast passenger list is American, while the reverse is very likely to be the case on the Atlantic. Opposition to prohibition is so pronounced in some

quarters that many shipowners believe it is of foreign inspiration, though paraded under the guise of personal liberty and the rights of the people.

The Matson Steamship line reports an equally satisfactory condition. It is stated by William Sellender, general passenger agent, that their volume of business has shown not the slightest decrease since prohibition went into effect. The receipts do not bear out assertions that prohibition has ruined the shipping business and that every one wants to travel on foreign ships with

liquor. Intoxicating liquors have never been allowed on the Matson line ships so no adjustment was necessary to meet the conditions of the prohibition law. It was further pointed out that prospective passengers rarely inquired concerning liquor on ships and no instance is recalled where patronage has been lost because of prohibition.

Capt. Samuel von Ronkel, master of the Java-Pacific line steamer **ARAKAN**, died suddenly in Hongkong, March 24.

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

Quotations Corrected to April 12, 1923, on Future Loadings

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General cargo cu. ft.	100 lbs.	Finished steel	From North Pacific Ports to	Lumber Per m. ft.
Liverpool.....	2s	\$0.35	\$0.20	\$0.15	\$0.30	\$0.60	\$7.00T	San Francisco.....	\$6.50 to 7.50
London.....	2s	0.35	0.20	0.15	0.30	0.60	7.00T	South California.....	7.50 to 8.50
Christiania.....	\$0.19	0.35 to 0.40	0.40	0.24	0.32½	0.85	8.00T	Hawaiian Islands.....	10.00 to 10.50
Copenhagen.....	0.19	0.35 to 0.40	0.40	0.24	0.42½	0.85	8.00T	New Zealand.....	14.00 to 16.00
Hamburg.....	0.11	0.27½	0.25	0.17	0.37½	0.75	7.00T	Sydney.....	14.00 to 16.00
Bremen.....	0.11	0.27½	0.25	0.17	0.37½	0.75	7.00T	Melbourne-Adelaide...	14.00 to 16.00
Rotterdam.....	0.14	0.25	0.25	0.18	0.35	0.70	7.00T	Oriental Ports.....	11.50 to 14.50
Antwerp.....	0.14	0.25	0.20	0.18	0.35	0.70	6.50T	Oriental Ports (logs)...	18.00
Havre.....	0.16	0.40	0.22½	0.23	0.40	0.75	8.00T	Peru-Chile.....	13.00 to 15.00
Bordeaux.....	0.16	0.40	0.22½	0.23	0.40	0.75	8.00T	South Africa.....	19.00 to 20.00
Barcelona.....	0.21	0.55	0.50	7.00T	-20.00T-		7.00T	Cuba.....	13.00 to 14.00
Lisbon.....	0.25	0.75	0.50	7.00T	-20.00T-		7.00T	United Kingdom.....	80s to 90s
Marseilles.....	0.21	0.55	0.50	5.60T	-20.00T-		5.00T	United Kingdom (ties)...	70s to 80s
Genoa.....	0.21	0.60	0.35	0.30	0.40	0.80	6.00T	Baltimore-Boston range.	\$13.00 to 14.50
Naples.....	0.21	0.60	0.35	0.30	0.40	0.80	6.00T	Baltimore-Boston range.	
Constantinople.....	0.22 to 0.25	15.00T	0.75	0.30	-20.00T-		8.00T	(ties).....	12.50 to 13.50
Alexandria.....	0.22 to 0.25	15.00T	0.75	0.30	-20.00T-		8.00T	Buenos Aires.....	14.00
Algiers.....	0.22	0.75	0.75	0.30	-20.00T-		10.00T	Flour and Wheat	
Dakar.....		14.50T		15.00T	-20.00T-		10.00T	Oriental Ports.....	\$ 5.00
Capetown.....	12.50T	17.00T	17.00T	12.50T	-17.00T-		12.50T	U. K. and Continent...	30sT
Buenos Aires.....		20.00T			-20.00T-		6.00T	Scandinavia.....	37/6 to 42/6T
Rio de Janeiro.....		21.00T			-21.00T-		6.00T	Mediterranean.....	37/6 to 42/6T
Pernambuco.....		22.00T			-22.00T-		8.00T	West Coast Italy.....	35s to 40sT
Havana.....	0.17½*	0.37½*		0.17½*	0.47*	0.94*	0.20*	Steel	
Vera Cruz.....		0.30		0.20	0.49	0.90	0.30	Oriental Ports.....	\$5.00T to 7.00T
Valparaiso.....		1.07		0.70	0.45	0.80	12.00T	Cotton	
San Francisco.....		0.40		0.56			0.30	Oriental Ports.....	35c to 50c per cwt
Sydney.....		18.00T		18.00T	18.00-24.00		9.00-12.00T	Apples	
Calcutta.....		16.00T		10.00T	-16.00T-		10.00T	United Kingdom.....	90 cents per box
T—Ton. †Landed. ††Heavy products limited in length. *Extra charge for wharfrage.								Copper	

Principal Rates To and From United Kingdom

	s	d		s	d
Grain, River Plate to United Kingdom.....	26	3	Coal, South Wales to Buenos Aires	14	6
Coal, South Wales to Near East.....	12	0	Iron ore, Bilbao to Middlesbrough.	8	3
Coal, United Kingdom to Germany.....	6	0	General British market, six months		
Pig Iron, United Kingdom to United States.	14	0	time charters, per ton per month	4	6

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
April 6, 1922	\$5.30 @ 5.90	\$1.16½	4.75 cents
July 1.....	8.10	1.26½	4.75 cents
Oct. 13.....	8.55	1.45	5.50 cents
Jan. 11, 1923	7.90	1.50	4.75 cents
March 12.....	7.00 @ 7.70	1.66½	5.15 @ 5.75c
April 11.....	6.75 @ 7.50	1.76½	5.10 @ 5.35c

At Philadelphia

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
April 10, 1922	\$5.90 @ 6.25	\$1.05	4.25 cents
July 1.....	8.00	1.15	4.25 cents
Oct. 13.....	8.30	1.47	5.00 cents
Jan. 9, 1923	7.30 @ 8.00	1.57½	5.00 cents
March 10.....	6.15 @ 7.10	1.66½	5.10 @ 5.65c
April 10.....	6.00 @ 6.50	1.87	5.10 cents

Other Ports

Boston coal, per ton.	\$10.24
Boston, oil, f. a. s., per barrel.	\$1.50
Hampton Roads, coal, per ton t.i.b.	7.55 @ 7.85
Seattle, coal, per ton.	7.50 to 8.50
Cardiff, coal, per ton.	30s
London, coal per ton	36s
Antwerp, coal, per ton	37s

Large Size Marine Oil Engines

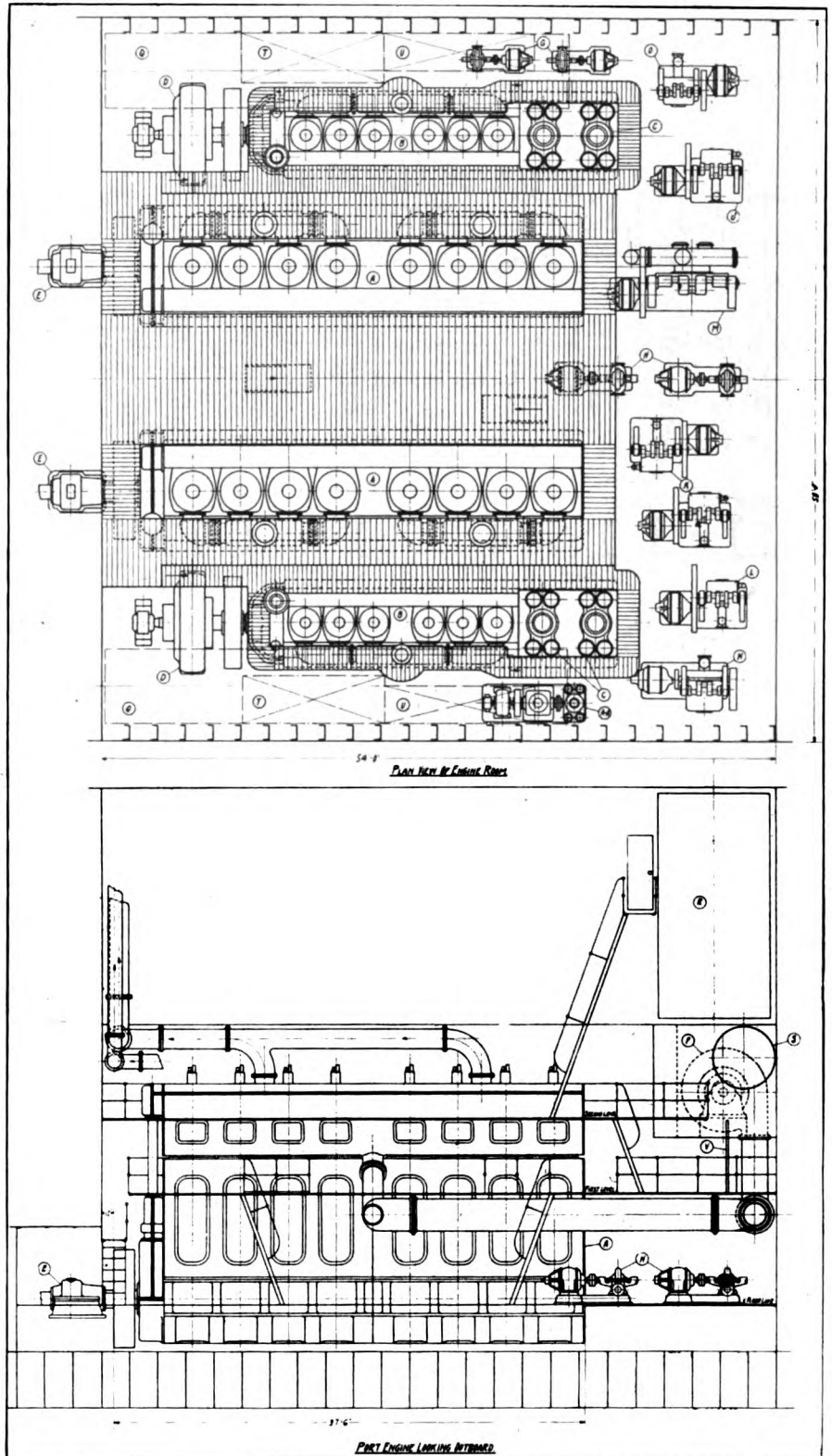
American Builder Designs 6000 Shaft Horsepower Lay-out for Use on Converted 12,000-Ton Freighter

APPLICATION of diesel type engines to ships has been met with a certain degree of conservatism in the United States. In considering this attitude, the underlying reasons in a broad sense have nothing to do with the mechanical production of a good type marine oil engine in this country, notwithstanding the fact that this type has not made the progress here that it has abroad, in Denmark for instance. The shipowners can not fairly lay the blame for the comparatively few oil engined ships under the American flag to lack of progress in turning out successful engines of this type. In other words, with all the resources and mechanical genius that it is possible to draw upon, the perfection of this type of motive power awaits a genuine show of interest on the part of the shipowner and operator.

Rapid progress in improvement of the marine oil engine abroad is primarily due to the alert and active interest shown in ship operation economies by the shipowners and operators. Why should shipowners and operators abroad show a keener interest in questions affecting economies? The reason is clear, these nations consider their merchant marine as a vital part of their national welfare. In the United States prior to the war, the merchant marine in foreign trade did not have united backing, with the result that no great interest was aroused by new developments in the marine field. Attempts to go into overseas trade have been pursued in a half-hearted manner, due to absence of that vital force, recruited for any enterprise when it is backed with the spirit aroused by a universally recognized need.

When ships had to be built to meet the demands for shipping during the war it was necessary to use the old tried, well known methods in order to speed up production. Economy in operation at this time was distinctly of minor importance. Completed ships which could move with safety and certainty were the prime consideration. In the meantime conditions have changed completely. The over supply of ships and the disorganization of formerly wealthy and powerful nations and exhaustion of other nations, which have for the past two years tended to retard production and commerce, have caused a slump in shipping. Many ships are idle and those that are in operation are receiving freight rates so low that the margin of profit has been reduced to a minimum and many instances occur

where losses instead of profits have resulted. Though shipping is at a low point, the products of the existing commerce of the world must be moved and in the very nature of things must be moved at a profit to the shipowners. No



ship can be maintained in operation under these conditions without the utmost economy.

Without too much optimism in regard to the national attitude toward a merchant marine, undoubtedly indications of a growth in interest on the part of the

American people are plain. When the public mind of the nation becomes set on a merchant marine, its success is assured. The interest which is needed in the perfection of the diesel for marine propulsion is now manifesting itself. Immediate application of this type of

motive power will be in the conversion of existing vessels, where feasible in making a sufficient saving, allowing for the additional capital outlay, rather than in building new ships. It is natural to assume that the ships now laid up are for the most part the least efficient. On account of the present reluctance to make any capital outlay, owing to the low earning power, conversion would be made at this time only where it is possible to write down the capital cost of the ship to a sum so low that an addition of the conversion costs will still make possible fair returns.

So far practically all of the marine oil engines built in the United States have been of comparatively small sizes. The Busch-Sulzer Bros. Diesel Engine Co., St. Louis, has recently completed a 2500 brake horsepower marine diesel for the United States navy, which it is claimed was, when completed late in 1922, the largest oil engine built in the United States up to that time. The company has also recently submitted a twin-screw layout of 6000 shaft horsepower for conversion of an existing 12,000 deadweight ton cargo vessel.

Four different views of this layout are shown in the accompanying illustrations. On the basis of a consumption of 0.42 pounds of oil per shaft horsepower per hour, the total oil used would be 27 tons per day, while steam reciprocating engines of equivalent power, that is 6660 indicated horsepower, would consume at 1.1 pounds of oil per indicated horsepower per hour, 77 tons of oil per day. Reducing these amounts to costs at 5 cents a gallon for diesel oil and \$1.565 a barrel of fuel oil, will give \$396.90 per day for the diesel installation and \$783.09 for the steam engine installation. These figures are of course subject to some variation, but on the whole represent a fair difference in the matter of fuel consumption for the same powers and speed of ship.

Some of the principal particulars of the main drive and auxiliary engines are noted as follows:

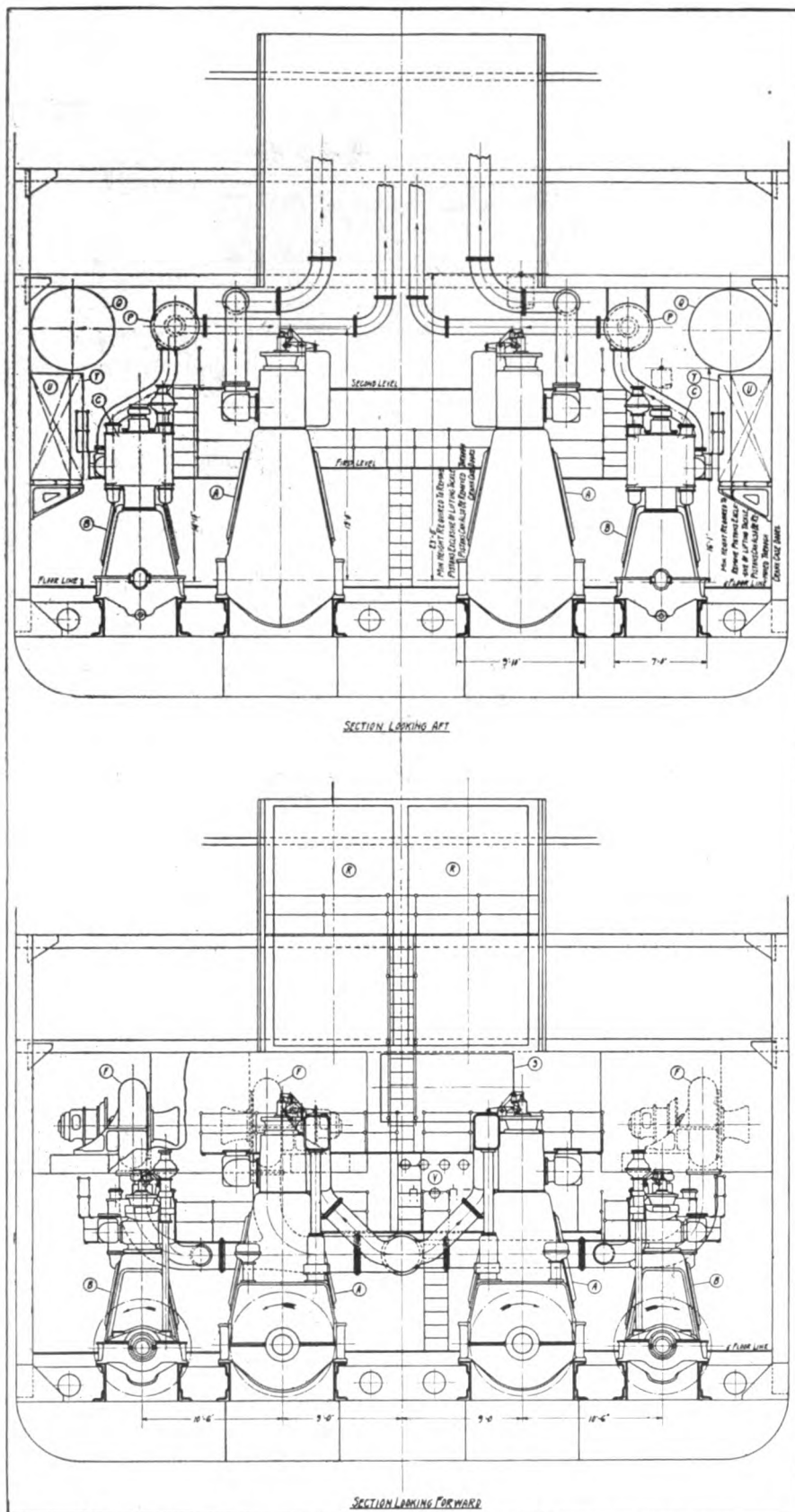
The main engines are of the 2-cycle type.

Number of main engines	2
Number of working cylinders, each engine	8
Diameter of cylinder bore, inches	23¾
Piston stroke, inches	41½
Normal operating speed, revolutions per minute	102
Rated shaft horsepower—total for two engines	6000

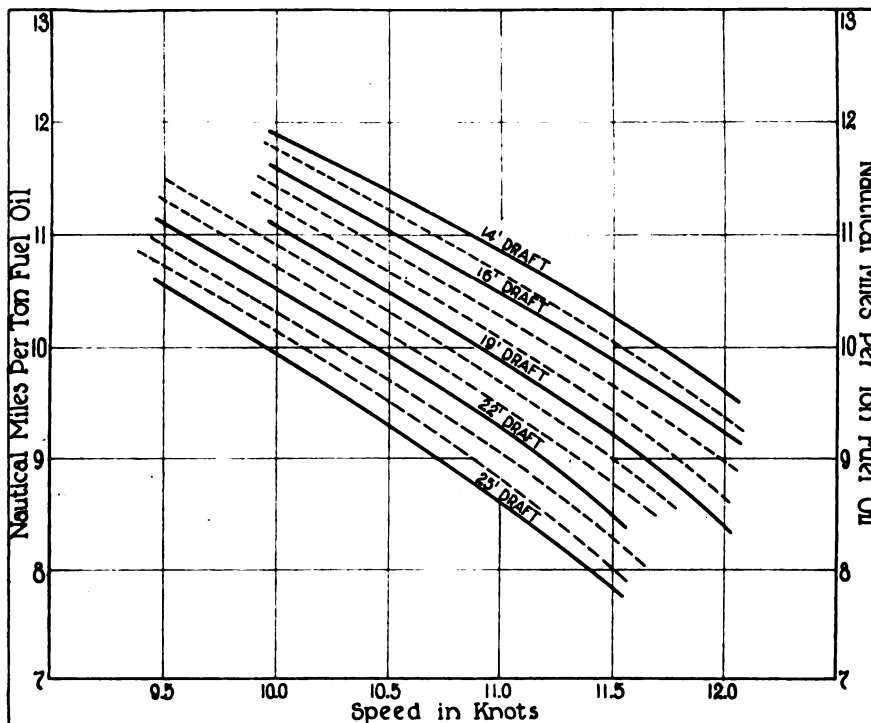
The auxiliary engines are also of the 2-cycle type:

Number of auxiliary engines	2
Number of working cylinders	6
Diameter of cylinder bore, inches..	17
Piston stroke, inches	27

(Concluded on Page 183)



SECTIONS THROUGH LARGE AMERICAN DESIGNED MARINE OIL ENGINE



PERFORMANCE CHART OF HOG ISLAND VESSELS BASED ON ACTUAL VOYAGE RECORDS BELOW

Name of Vessel	Draft		R.P.M.	Observed speed	Tons fuel per 24 hrs.	Pounds fuel per mile	Knots per		Ton—% Efficiency
	ft.	in.					Actual	Theoretical	
AFEL.....	24	5 3/4	73.4	8.96	23.48	201.0	9.15	10.69	85.5
AFUNDRIA.....	22	5 3/4	79.4	10.30	28.40	257.3	8.71	10.00	87.1
AMERICAN PRESS.....	22	1 1/2	78.1	10.32	28.71	259.7	8.63	10.07	85.7
ARGOSY.....	21	1 1/2	76.0	10.49	27.18	241.6	9.26	10.17	91.1
BIRD CITY.....	21	9 1/2	78.5	9.73	27.49	261.9	8.49	10.87	78.1
BLAIR.....	22	4 1/2	78.9	10.09	30.27	280.0	8.00	10.32	77.5
CAPILLO.....	20	4 1/2	82.9	10.60	30.28	266.7	8.40	10.09	83.3
CARENCO.....	20	4 1/2	83.3	10.81	27.64	238.6	9.39	9.88	95.0
CARDONIA.....	24	2 1/2	84.4	10.61	31.91	280.7	7.98	9.30	85.8
CARLTON.....	22	6 1/2	80.1	10.39	23.33	209.6	10.69	9.92	107.8
CARPLAKA.....	20	1 1/2	80.6	10.58	29.01	255.9	8.76	10.13	86.5
CHESTER VALLEY.....	22	3 1/2	80.3	10.65	28.61	250.7	8.93	9.69	92.2
CHICKASAW.....	18	10 1/2	85.3	10.74	32.11	279.1	8.03	10.18	78.9
CITY OF FLINT.....	17	3 1/2	78.9	10.92	32.96	281.7	7.93	10.30	77.0
CITY OF ST. JOSEPH.....	21	1 1/2	79.3	10.32	28.70	259.6	8.64	10.27	84.1
CLAVARACH.....	23	2	80.7	10.00	28.07	262.0	8.55	10.26	83.3
CLEARWATER.....	20	11 1/2	81.7	10.12	31.38	289.5	7.73	10.37	74.5
CLIFFWOOD.....	23	8	81.2	9.95	28.85	270.6	8.28	10.24	80.9
CLONTARY.....	22	10 1/2	77.6	9.50	30.02	295.0	7.59	10.95	69.4
COANOMA COUNTY.....	20	11 1/2	77.0	10.58	31.29	276.0	8.12	9.80	82.9
COLLEDA.....	24	1	81.8	10.2	30.72	280.7	7.98	9.80	81.5
COEUR D'ALENE.....	18	2 1/2	81.4	10.27	28.89	262.6	8.54	10.90	78.2
CODY.....	24	2 1/2	86.6	10.17	24.91	229.0	9.81	9.83	99.9
COLD HARBOR.....	19	3 1/2	82.5	11.10	32.08	269.8	8.30	9.70	85.6
COLD WATER.....	19	1 1/2	85.2	9.64	27.50	266.2	8.41	11.40	73.7
COLLAWER.....	23	5 1/2	83.3	10.60	32.75	288.5	7.77	9.50	81.8
COLLINGSWORTH.....	19	11 1/2	81.3	10.86	31.92	274.3	8.18	9.80	83.5
COLTERAPS.....	22	3 1/2	76.3	11.19	33.41	279.3	8.03	8.87	80.6
COMACK.....	19	1 1/2	76.1	9.78	23.94	228.0	9.98	11.30	88.3
COMEROS.....	17	6 1/2	84.0	10.77	29.32	254.5	8.83	10.4	84.9
CONNESS PRAE.....	21	11 1/2	79.8	10.73	29.58	257.2	8.63	9.62	89.8
CORSON.....	20	7 1/2	86.1	11.00	33.80	287.2	7.82	9.57	81.7
FLUOR SPAR.....	20	4 1/2	78.3	10.18	29.26	268.5	8.34	10.58	78.7
HOG ISLAND.....	22	3	86.2	11.34	30.97	254.8	8.78	8.72	100.7
INDEPENDENCE HALL.....	22	11 1/2	85.8	11.28	31.41	259.9	8.62	8.90	96.9
JOLEE.....	18	8 1/2	76.9	9.14	25.44	259.9	8.62	12.20	70.6
JOMAR.....	24	7 1/2	79.6	10.15	26.40	242.7	9.23	9.80	94.2
KENOWIS.....	20	8 1/2	85.86	10.42	31.05	278.4	8.04	10.28	77.5
LABETTE.....	23	0 1/2	74.4	8.84	30.94	327.0	6.86	11.69	58.7
LAPCOMA.....	22	1 1/2	78.0	10.03	29.46	274.0	8.17	10.43	78.2
LIBERTY BELL.....	21	10 1/2	81.38	10.62	24.43	214.6	10.43	9.80	106.4
LIBERTY GLO.....	20	5 1/2	81.2	10.06	26.89	249.6	8.98	10.70	83.8
LORAIN CROSS.....	22	4 1/2	81.3	10.10	29.44	271.8	8.23	10.32	79.6
LUXPALLE.....	20	3 1/2	79.8	10.44	31.66	283.0	7.92	10.30	76.9
MAGNERIC.....	22	8 1/2	82.2	10.64	27.32	239.7	9.35	9.60	97.4
MAIDEN CREEK.....	21	3 1/2	78.3	9.75	27.75	265.7	8.43	10.32	77.1
MINNEQUA.....	21	5 1/2	78.7	10.99	27.61	234.5	9.55	9.37	101.9
NOBLES.....	24	2	85.0	9.84	29.93	283.0	7.89	10.27	76.8
QUISTCONCE.....	22	2 1/2	76.9	10.85	28.13	241.1	9.26	9.42	98.3
SACANDAGA.....	23	0	75.2	9.45	27.63	272.9	8.21	10.98	74.8
SAC CITY.....	21	0 1/2	84.8	10.41	30.09	269.8	8.30	10.19	81.5
SACCARAPPA.....	20	10 1/2	71.5	8.73	28.82	307.2	7.26	12.35	58.7
SUDANCE.....	23	10 1/2	82.9	10.48	29.19	260.0	8.62	9.54	90.4
SAGUACHE.....	23	7 1/2	84.8	10.41	28.09	251.9	8.89	9.70	91.6
SALVATION LASS.....	22	4 1/2	78.5	10.71	28.70	250.1	8.96	9.69	92.5
SARGAMON.....	24	0	83.3	10.27	27.45	249.5	8.95	9.78	91.5
SAPINERO.....	22	7	84.0	10.34	27.45	247.8	9.04	9.99	90.5
SARCOXIE.....	18	6 1/2	86.4	11.11	32.11	269.8	8.31	9.82	84.6
SATARTIA.....	21	1 1/2	86.4	10.25	30.35	276.4	8.11	10.35	78.4
SAUGERTIES.....	22	8	85.1	10.54	28.22	249.9	8.96	9.70	92.4
SAUGUS.....	19	8 1/2	74.9	9.76	26.93	257.8	8.71	11.20	77.8
SCHODACK.....	21	6 1/2	84.0	10.70	33.43	291.6	7.68	9.76	79.2
SCHONARRIE.....	19	0 1/2	83.6	10.47	30.30	270.8	8.29	10.50	78.9

Set Operating Standards for Hog Island Ships

Complete reports were given in the January and April issues of MARINE REVIEW of the performance standards set by the government's fuel conservation committee for the shipping board's passenger liners. Similar standards, worked out from actual performance data, have been set for the Hog Island type of freight ships. The accompanying table shows the performance record, the following example used with the accompanying chart, shows how this information can be put to practical use by operators of these vessels in increasing efficiency.

To find the percentage performance of a ship, take one of the 7500 dead-weight tons ships built by the American International Shipbuilding Corp., known as Hog Island type "A" ship.

Mean draft on leaving port, ft., in. 24 0
Mean draft on arriving, ft., in. 23 0
Mean draft on voyage, ft., in. 23 6
Distance traveled, nautical miles 3000
Fuel consumed, tons 310
Speed, knots 10.2
Actual nautical miles per ton of fuel 3000

—=9.68.

310
Standard nautical miles per ton of fuel for 10.2 knots and 23 feet 6 inches draft (from curves)=9.95.

$$\frac{9.68 \times 100}{9.95} = 97$$

per cent.

J. S. Jones Made Executive of Chas. Cory & Son

Joseph Stansbury Jones, who has been assistant to the president, W. S. Doran, of Chas. Cory & Son, Inc., 183-187 Varick street, New York, has been elected vice president.

Mr. Jones resigned from the navy department, being then at the New York navy yard, as senior electrical expert aid in 1919, to become associated with the Cory corporation. His many years of varied experience with engineering problems pertaining to the navy and merchant marine have well fitted him for his new duties.

The Cory corporation was established in 1845 and is the pioneer in the design and manufacture of signal, communicating and lighting equipments for the navy and merchant marine. It possesses the distinction of having made the first installation of electric lights aboard ship. The Cory corporation today has the largest plant in the world manufacturing ships' telegraphs, signaling, communicating and lighting systems.

Ruhr Seizure Revives U. K. Fleet

Coal Demand Dominates Vessel Market in First Quarter—Official Report on Relations Between Shippers and Shipowners

BY CUTHBERT MAUGHAN
Shipping Editor, The Times, London

DURING the first three months of the present year, the shipping industry has confirmed the old saying that it is the unexpected that always happens. Surprise has succeeded surprise. The omens at the end of 1922, were quite favorable. Signs of improvement in trade could be found, and, although well informed business men expected no "boom," at any rate as far as British trade was concerned, they seemed to see the prospect of steady recovery. In the closing weeks of 1922 quite a large number of orders were being placed for new tonnage and, notably, by some owners who hitherto, had been deterred from building by high costs of construction. Christmas found shipowners in good humor, and even builders who had had a most depressing 12 months were encouraged by the outlook. The new year really started auspiciously.

Year's First Surprise

Within a very few days, the business atmosphere underwent a remarkable change. It synchronized with the breakdown of the reparations conference in Paris. Shipbrokers who had been experiencing such activity as recalled pre-war days, began to find time hang heavily on their hands. The immediate cause of the dullness which succeeded the activity was a sudden falling off in demand by grain buyers in the United Kingdom for tonnage. The explanation offered was that financial difficulties on the continent had become so acute that dealers were no longer buying grain, and so tonnage to load grain cargoes abroad was not wanted. This particularly affected the river Plate district, from which there is, usually, a steady stream of ships bringing wheat, maize, or other grains.

Owners of vessels which had been dispatched from Europe to North and South America suddenly found that the demand for ships in these quarters had "dried up," and after keeping the vessels lying idle in the hope that a revival would come as suddenly as the falling off had occurred, owners began to look for other markets to which they could send their ships. Thus some of the vessels which had been dispatched to the river Plate were ordered to the west coast of South America, where exports of nitrate provided employment for a few of the ships for a short time.

This decline in the demand for tonnage was the more disappointing because returns prepared by the Chamber of Shipping of the United Kingdom had shown a substantial improvement in the figures of vessels laid up idle in the ports of Great Britain and Ireland. On Jan. 1, 1922, the number of vessels so reported laid up was 712, representing 1,307,000 tons. By Oct. 1, 1922, the number had been reduced to 456 vessels of 824,000 tons and by Jan. 1 of this year there was a further reduction to 411 vessels of 732,000 tons.

This steady reduction in the amount of idle tonnage was very encouraging, because once vessels are laid up owners naturally, will not go to the trouble and expense of recommissioning them, unless they see a prospect of fairly well assured and profitable employment. Yet, by the middle of January, owners were beginning to lay up their vessels again, and the direct cause of this was the falling-off in the buying of grain for Europe. It was never suggested that Europe did not want the grain, but she had not the means of paying for it. This cessation of the keen demand was one of the surprises for shipowners during the first quarter of 1923.

At about the time that owners were beginning to lay up their vessels, or to think of doing so, brokers began to show interest in increased inquiries which came from the continent, and especially from Germany, for coal. At first the business remained in the inquiry stage, but the inquiries were fairly well spread among the coal exporting centers of Britain. Within a few days, and by the third week of January, a fairly large volume of tonnage had been secured to carry coal from the east coast of England, Scotland, and South Wales to Germany.

Start of Coal Trade

With the extended occupation of the Ruhr by France, the output of the collieries there began to decline, and France also was in the market for coal. The demand steadily grew. The continent may not have been able to provide the means of buying foodstuffs, but, somehow or other, it seemed to have no difficulty in providing the means of buying coal. The situation created was thus rather curious. However much it might cost her, Germany, evidently, was intent

on securing fuel. It was essential, of course, for carrying on all her manufacturing, and she was known to be very heavily engaged in export business.

No doubt the precedence given to coal over grain was justified. As long as Germany had coal she could carry on her manufacturing, and credits would be created abroad. With these credits, grain and other foodstuffs could be bought.

The essentials of work were seen to be placed ahead of the essentials of food, and it can only be assumed that she had substantial stocks of foodstuffs already in the country, for without food people obviously can not work.

Coal Demand Unprecedented

Since January the demand for tonnage to carry coal to Germany has increased, and the proportions of the trade have been far greater than anything that has previously been experienced. Its magnitude has been reflected in the employment of large vessels in the trade of a type that, as a rule, are employed only in the long distance ocean trades. Before the war, the average carrying capacity of vessels employed in the short distance trades between the United Kingdom and the continent, representing two or three days' steaming was from about 1000 to 3000 tons, but this year many steamers with a deadweight carrying capacity of as much as 10,000 tons have been secured. In some cases, ships of large size have been chartered for a series of voyages which, taking into account the time occupied in loading and discharging, will keep them busy for three months or so. The rates of freight paid for the single voyage have ranged from about 7s 6d to 9s a ton for each trip.

So large has been the volume of chartering that it has affected rates of freight in other trades, especially to South America, and the coal bunkering stations abroad. At the beginning of the year, the current rate of freight from South Wales to the River Plate was on the basis of about 12s a ton, but by the middle of March rates of 18s and 19s per ton were being paid. It has to be remembered, though, that this remarkable rise has been due, partly, to the falling off in the homeward demand for tonnage to load grain, since owners naturally take into account the freight earnings on the round voyage. At the

beginning of the year the ruling rate for homeward grain cargoes was about 27s 6d per ton. This gradually fell away until, in the middle of March, about 19s was being offered and accepted by owners. It was known that, in some cases, owners were willing to accept such rates, not because it was profitable, but because it minimized the loss in bringing home tonnage, either to be laid up or to be employed in short distance trades. When the exceptional demand for tonnage to carry coal to Germany started, vessels were also being chartered to carry coal to the United States.

Toward the end of February it began to be clear that the United States was also participating in the abnormal inquiry from the continent for coal, and tonnage was at first chartered for the voyage from the United States on the basis of \$2.25 per ton. This rate gradually hardened, and in the middle of March tonnage was being secured to load coal in United States during April at \$3.50 per ton, during May at \$3.50, and for June loading at \$3.25.

A rise in the rate naturally brought increased offers of shipping. Tonnage was also wanted to load coal for other continental destinations. Thus, in March, rates of about \$4 were being offered and accepted for the voyage to west Italy with loading during March-April and for loading in April at \$3.75. Arrangements were also made for securing tonnage to carry American coal to France, Greece, Spain and the Scandinavian countries. A peculiar feature of the position was that vessels were being chartered to carry coal from the United States to Europe and also from the United Kingdom to the United States, under existing contracts, at the same time. It will be seen that the exceptional volume of coal business has, during the first quarter of the present year, dominated the freight markets. The exceptionally large volume of the business was another of the surprises which the opening of the year has brought for ship-owners and shipbrokers.

The volume of chartering raised the question of working hours at the coal shipping ports. It has long been felt that, instead of two working shifts of eight hours each, there should be three working shifts, so that the work at the ports should never cease. This would have enabled a larger volume of coal to be dealt with at the collieries and would have avoided some of the serious congestion of shipping at the ports. Negotiations between the various interests directly concerned proceeded, and at one time a settlement seemed near but fur-

ther difficulties blocked any agreement.

Satisfactory as was this great volume of business in many ways, it had its disturbing feature in the ill effects of the rise in coal prices for all the manufacturing industries, and also for all the liner shipping companies which could not share in the coal trade. Figures showed that the prices of bunker coal advanced after the occupation of the Ruhr by France and before the middle

The rise in the coal prices was a surprise for the managers of the liner companies. During 1922, they had been successful in reducing working costs, notably in wages and in port charges, and they had not calculated on an upward movement in the cost of coal. The demand for coal has saved the situation for the owners of cargo steamship tonnage, but it certainly has not done the liner companies any good.

For the liner companies, the first quarter of the present year was notable for the occurrence and settlement of a dispute between the shipping companies in the Australian trade and the Commonwealth Government Line, and the raising of an important principle. The establishment of a fleet of liners by the Commonwealth government in 1916 was regarded by the shipping companies as a disturbing influence. The managers of the shipping companies were always influenced by the consideration that political factors might affect the operation of the government line, and these fears do not seem to have been altogether groundless.

The shipping companies could rely on the support of the merchants who, as a

body, are not favorably disposed to government trading, and they also operate what is known as the deferred rebate system. Briefly this meant that those merchants who, at the end of a certain period, are able to state that they have confined their shipments to the companies are entitled to a rebate on their freights. The system is now in operation in various trades, and, at the request of some of the smaller merchants in the trade, it was reintroduced

after lapsing during the war, in the service between the United Kingdom and west Africa early last year.

The smaller merchants are inclined to favor the system, since it prevents, or tends to prevent, large merchants from chartering outside tonnage at specially favorable rates when circumstances enable them to do so. The action of a few large shippers might thus depreciate the value of the stocks of the smaller men. It is claimed on behalf of the rebate system that it insures stability and equality of rates, and there has been no sign of any strong opposition to it of late by merchants. However, the management of the Commonwealth Government line found that it was unfavorably affecting its trade and as the management claimed that, under Australian law, it could not employ the system, it appealed to the imperial shipping committee, which was established in June, 1920, to investigate the whole question.

British Shipping Index

PRICES OF REPRESENTATIVE SHIPPING SECURITIES IN 1923

Securities	Highest £ s d	Lowest £ s d
Cunard £1 shares.....	1 4 9 (March 13)	1 2 3 (Feb. 26)
P. & O. deferred £100 stock	332 0 0 (Jan. 2)	300 0 0 (March 3)
Furness, Withy £1 shares	1 17 0 (Jan. 16)	1 14 9 (Feb. 26)
Royal Mail S. P. C. £100 stock	99 12 6 (Jan. 2)	95 0 0 (Jan. 9)

SHIP CONSTRUCTION IN UNITED KINGDOM, FIRST QUARTER, 1923

	Gross tons
Tonnage launched	228,371
Tonnage commenced	355,203
*Tonnage building, March 31..	1,492,138
*Includes 181,000 tons of construction suspended.	

SHIP MANAGEMENT FACTS IN FIRST QUARTER OF 1923

Time Charter Rates:	Highest £ s d	Lowest £ s d
Ordinary British steamers per ton dead-weight per month	0 4 0	0 4 0
Voyage Rates:		
Plate—United Kingdom grain, per ton.....	1 11 3	0 18 0
Australia—United Kingdom grain, per ton..	2 5 0	1 13 9
Cuba—United Kingdom sugar, per ton.....	1 1 0	0 18 9
South Wales—Buenos Aires coal, per ton...	1 0 0	0 11 6
Chile—United Kingdom—Continent nitrate per ton	1 10 0	1 7 6
Fuel:		
Coal:		
Best Welsh large S. Wales, per ton.....	1 18 0	1 8 0
Oil:		
Per ton at Port Said.....	4 5 0	3 17 6
Wages:		
A. B. Seamen, per month.....	10 0 0	10 0 0
Firemen, per month.....	10 10 0	10 10 0
Assistant stewards, per month.....	9 5 0	9 5 0
Boatswains, per month.....	11 10 0	11 10 0

of March, by 2 per cent. As a result companies which were asked to pay the higher prices were, naturally enough, somewhat critical, and were inclined to adopt the attitude that, if Germany wanted coal and supplies were available, she was entitled to have them, but that the British consumers should be able to obtain their supplies at the level ruling before the extraordinary demand from the continent forced up prices. There was a good deal to be said for such a contention, since cheap coal means a very great deal for industry, and the level of working expenses of the British liner companies is on a substantially higher level than that of the German ownerships. Such a discrimination could, at any rate to some extent, be exercised, voluntarily, or it could be enforced by government control. Yet government control is now anathema to British business men who, generally, want as little as possible as they can have of it.

The committee took evidence from various interests and lately issued its report. On this committee, which was appointed by Mr. Lloyd George, when prime minister, were represented the British board of trade and the governments of the British dominions, together with business interests under the presidency of Sir Halford Mackinder, an economist of recognized standing.

The outstanding feature of the committee's report was recognition of the fact that some "tie" between shippers and the liner companies is needed. The committee pointed out that there is a clear mutual obligation—the shipper wants the ship on the berth without fail, and the shipowner wants the goods on the berth without fail. Hence the committee held it to be necessary for the shipping conferences to have some assurance of continuous support from shippers, such as will constitute an effective method of preventing intermittent and irresponsible competition for berth cargo by outside ships.

Urge Close Agreements

Since there was some opposition in certain quarters to the system of deferred rebates, the committee recommended that there should be the alternative of a system of agreements between shippers and shipowners, and that this agreement system, although equally open to objections, should be given to shippers as a running option. Individual shippers should, it was proposed, have the choice (A) of binding themselves by means of an agreement over a certain period or by a running agreement subject to a certain period of determination, or (B) of remaining under the deferred rebate system. They also held that such an agreement should provide for penalties, whether by way of liquidated damages or other methods, which would attach to breaches of the agreement by either party to it.

The second outstanding recommendation of the imperial shipping committee was that in all trades where there was no representative association of merchants, steps should be taken to form such a body. The main objects of such associations should, the committee recommended, be to discuss and settle amicably any outstanding differences and questions of mutual concern as they might arise and, to deal with the exercise of the option, between the rebate and agreement systems. The committee called attention to the good work done by the merchants' associations already in existence in discussing matters with the shipping lines. Associations to which it referred included the Australian Traders' association, and the Manchester Association of Importers and Exporters.

In accordance with the recommendations of the imperial shipping committee,

a draft form of agreement was prepared in March. The first clause stated that the object of the agreement was for the purpose of maintaining regular steamship services between the United Kingdom and the commonwealth of Australia, with stability of freight and equality of rates and conditions. Under another clause, the shipowners agreed to provide steamers to maintain regular and frequent berth sailings from ports in the United Kingdom to ports in Australia "both as customary in such numbers and at such intervals as is necessary to provide sufficient tonnage for the ordinary requirements of the trade. The steamers are to sail full or not full on advertised dates as nearly as practicable."

The shipowners reserved liberty to revise rates for individual classes of cargo as circumstances required, but they agreed that no general increase in basis rates should be made except after consultation with the Australasian Merchants' association and full consideration of the shippers' views thus ascertained, so giving effect to the recommendation of the imperial shipping committee respecting close co-operation with the merchants.

The shippers, on their side, agreed to give their entire support to vessels loaded by the shipowners as regards all shipments from ports in United Kingdom to ports in Australia, and to make no such shipments by any vessels other than those loaded by the shipowners unless after consultation and with their concurrence. On the subject of penalties, in the event of any breach of the agreement by the shippers, the latter undertook to pay as liquidated damages a sum equal to the amount which have been their accumulated rebate on all shipments under the agreement if they had been shipping under the deferred rebate system. It was agreed that in the case of large parcels of cargo, not being ordinary merchants' berth cargo, the shipowners should have liberty to quote special rates.

Fix Penalties

The liability of the shipowners in the event of any breach of the agreement on their part was not specifically named, because obviously, it would be extremely difficult to specify, in advance, the damages which would be incurred by the lines were they to break the terms of the agreement, since the extent of the damages would vary according to the circumstances of each case. But both parties expressly acknowledged that the agreement was to be governed by the law of England and they submitted themselves to the jurisdiction of the English courts, so far as any dispute arising out of the agreement was concerned, unless the parties had agreed to submit the dis-

pute to arbitration. It seemed clear that, while the liability of the shippers in the event of a breach of the agreement on their part was defined and limited, a liability undoubtedly attached to the shipowners in the event of a breach on their side and it might prove far more costly to them than a breach on the part of the merchants.

It is too early yet to indicate to what extent, if any, merchants will prefer to ship under this form of agreement, instead of under the rebate system. Under the rebate system the merchants make no promise to confine their shipments to the regular lines. They merely claim the privilege of the rebate if they are able to state that, during the period, they have restricted their shipments to the lines already in the trade. It also remains to be seen if the recommendations of the imperial shipping committee will be extended to other trades and if merchants will be given the option in those other trades, of working under a system of rebates, or on a system of agreement, such as is being prepared in the Australian route.

Recognize Mutual Obligations

Although the operation of rebates is illegal in United States the system is, I believe, employed by American lines in trades outside the United States. As regards British trade, the findings of the imperial shipping committee should clear the air on a subject which, from time to time, has been much discussed in recent years as showing that, in the regular liner trades, there are mutual obligations on the part of the shippers and the shipping companies.

In the meantime, while the publication of the report of the imperial shipping committee was awaited, an acute crisis had developed in the relations between the shipping companies and the Australian government line, and the latter cut the rates both outwards and homeward. When peace was declared on the basis of the committee's report, the reductions in the outward rates still held, and also some of those in the homeward trades from Australia.

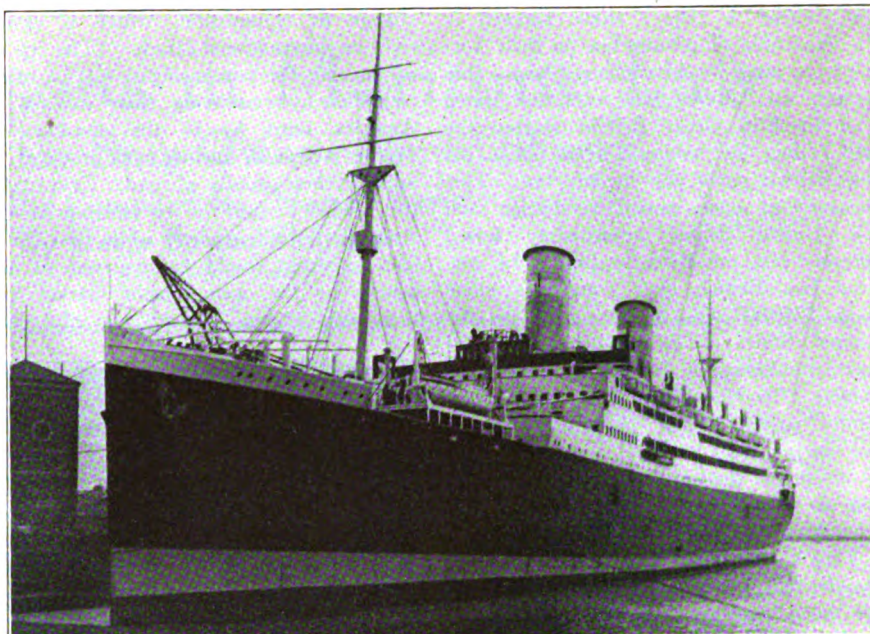
The shipping companies, after careful examination of the whole question, did not find themselves justified in completely following the Commonwealth Government line in the reduction in rates on some of the commodities, especially on certain fruits, from Australia to the United Kingdom and they found some support in the contention, advanced by the management of the Commonwealth Government line shortly before the cuts were made, that the reductions would not be justified on an economic basis. There are, consequently, on some commodities, two rates of freight in operation, those quoted by the Commonwealth Government line being lower than those which

the shipping companies felt able to accept. This discrepancy appears to illustrate the difficulties which some shipping managers have foreseen in the competition of a state enterprise, since it is always open to the latter to take factors into account other than purely economic considerations.

As usual, comprehensive annual reports have been issued by the Liverpool Steamship Owners' association and the Chamber of Shipping of the United Kingdom and, at the annual meeting of each body, detailed addresses have been delivered by the leading shipowners on important questions of the time. One to which prominence was given at the meeting of the Chamber of Shipping was the question of international taxation. This has introduced serious complications into the accountancy of shipping companies, for these can hardly be avoided when shipping companies, calling at many ports are taxed by each nation on their estimated earnings in the different countries, especially as the taxation is on varying scales. Happily, the United States has shown a way out of a difficult situation, and it is to be hoped that Britain will follow.

Test New Liner Built for Italian Owner

In April, trials were run in the Firth of Clyde of the Italian Lloyd Sabaudo liner CONTE VERDE, built and engined by William Beardmore & Co., Ltd., Dalmuir, Scotland. A sister ship, the CONTE ROSSO, also built and engined by the same builder, has been operating satisfactorily on the Mediterranean and North and South Atlantic routes. The only difference between the CONTE ROSSO and the CONTE VERDE is that the latter has the superstructure considerably strengthened and embodies a slight re-



NEW ITALIAN LLOYD SABAUDO LINER CONTE VERDE

arrangement of the passenger accommodation through the introduction of more special cabins de luxe.

The new vessel is 591 feet in length over all, 570 feet between perpendiculars, 74 feet in breadth, 40 feet in depth to shelter deck, 26 feet in load draft, of 18,000 tons gross, 20,000 indicated horsepower and 18½ knots speed. She will have accommodation for 230 first-class, 290 second-class and 1880 third-class passengers and a crew of 420, a total of 2820.

The first-class passengers will be berthed in specially large cabins for one or two persons, while certain cabins can be made intercommunicating so as to form suites. Special suites each comprising bedroom, dressing room and bathroom also are provided. The first-class dining rooms are unique, as the space of three decks is utilized for an upper

and a lower dining saloon, thus obtaining for each a headroom of 12 feet 6 inches. The first-class public rooms, the designs for which were prepared by Italian architects, include the two dining saloons, a music room, a social hall, a library and a smoking room with cafe. A large deck area is set aside for recreation and promenade purposes.

The second-class passengers will have large four-berth cabins, a dining saloon, a lounge, and a smoking room, while the third-class berthage is of the open type in large compartments with appropriate dining and recreation spaces.

The propelling machinery will consist of two sets of Parsons compound double reduction geared turbines, supplied with steam by six double-ended and two single-ended boilers, arranged to burn oil fuel but capable of being changed over rapidly to the use of coal.

Only 5.4 Per Cent British Fleet Idle

BY H. COLE ESTEP
European Manager, Marine Review

ABOUT the time the senate of the United States was talking the ship subsidy bill to death as far as the recent session of congress was concerned, a powerful foreign maritime organization, the Chamber of Shipping of the United Kingdom was holding its annual meeting in London, and giving vent to sentiments which must have been music to the ears of opposition senators. For about the fifth time the Chamber of Shipping of the United Kingdom went on record as being strongly opposed to subsidy for American ships. This opposition is based on broad

economic grounds, the argument being that aid by the American government to American shipping would be injurious to the American merchant marine and American export trade. Of course, the possibility of increased competition for British ships is a factor in the British attitude toward the American subsidy question, although this phase of the proposition was not mentioned at the meeting.

It was also revealed at the London convention that at the present time only 5.4 per cent of British tonnage is idle, amounting to 700,000 tons, compared with

36 per cent in the case of France and 60 per cent in the case of the United States. On Jan. 1, 1922, 10 per cent of British shipping or 1,300,000 tons were idle.

Although practically all of the British merchant marine is in operation, the earnings of the fleet are still exceedingly unsatisfactory from the shipowners' standpoint due to various conditions, such as excessive competition, high wages, heavy port charges, cost of fuel, etc.

In one of the resolutions passed at the meeting, the British government was urged to co-operate with the American

government to relieve ships engaged in foreign trade of income tax on their foreign earnings. Alexander Shaw, ship owner, who offered this resolution stated that in 1916 Great Britain started the ball rolling by making foreign ships using British ports pay income tax. This measure at once caused retaliation and the United States immediately levied income tax on British ships. In one year two British liner companies alone paid \$750,000 in income tax to the United States. The matter affects not merely shipowners, but traders and consumers. In November, 1921, the United States passed a law, providing that no income tax shall be payable in the United States upon the profits of ships belonging to countries which give a similar exemption to America.

This it was stated is a fair offer which the British government is being advised by the Chamber of Shipping to accept at once. The serious danger of a system of tax warfare between maritime powers was pointed out and in this connection the Chamber of Shipping is asking the British government "to pull up the weed which it has unfortunately planted."

Sir Ernest W. Glover, Glover Bros., shipowners, shipbrokers and insurance brokers, London, was elected president for the ensuing year, succeeding Sir Frederick W. Lewis of Furness, Withy & Co. Ltd., London.

In an address covering shipping conditions throughout the world, Sir Ernest said in part:

"A general survey of world conditions leads to the conclusion that general co-operation on an economic basis throughout the world is essential in order to promote the best interests of all nations. What I feel that we need more and more in the present world condition is that each country should develop along its own economic lines and that trade should be fostered and encouraged between all peoples irrespective of their political boundaries. Whatever the flag under which we live and whatever our affinities as nations, we must think internationally, remembering always the interdependence of nation on nation, for the real interests of one are the real interests of all.

"A proposal has been put forward to subsidize the American merchant fleet at the expense of ships under other flags. I often wonder what will be the result of such legislation, if it is put into effect. Will it promote American interests to penalize trade and shipping? The ship subsidy bill, if passed, would prevent us from rendering service in a most obvious way and by her import duties she would exclude our goods.

"The effect of such legislation would undoubtedly be to hamper the trade of all countries wishing to export goods to America, and thus prevent that free ex-

change of commodities which is essential in international trade. The effect of limiting the purchasing power of other countries by restricting their exports to America must be to the disadvantage of the American farmer and producer in selling their goods abroad. Eventually the tendency must be to raise prices in America for all imports, while the American exporter would be deprived of the benefit of the open freight market and thus pay higher charges on his ship-



SIR ERNEST W. GLOVER
President of the Chamber of Shipping of the United Kingdom, 1923. He is a Partner in Glover Bros., Shipowners, Shipbrokers and Insurance Brokers, London

ments and get no higher price in the consuming markets where only the world price can be obtained. Thus the result, while clearly a disadvantage to other countries, may well prove to be of very doubtful advantage to America.

British Port Dues High

"In our negotiations with the dock and harbor authorities, we have obtained figures to show that the same steamer discharging a cargo of grain would pay total expenses in London amounting to £935 (\$4400), in Hull £867 (\$4070), Bristol £960 (\$4510), while the charges in Antwerp would be only £375 (\$1765) and in Rotterdam £600 (\$2820).

"These contrasts appear in other directions. If we look at ore we find that a steamer discharging at Middlesbrough would pay about 6d (\$0.12) per ton more than at Rotterdam, and occupy six or seven days as against two or three; thus Middlesbrough must pay a higher freight than Rotterdam to obtain its raw material. When the ore has been converted into finished steel for export, I find that a berth steamer loading a parcel of 1500 tons of cargo would

spend £750 (\$3530) at Middlesbrough as against £350 (\$1645) at Antwerp—roughly 5s (\$1.17) per ton more. The English exporter is, therefore, prejudiced in competition with the continent in selling rails, beams, plates, etc., to the extent of about 6s (\$1.40) a ton, simply on account of the heavy charges.

"A new ready cargo steamer of the ordinary type which cost two or three years ago £20 to £30 a ton, can now be bought from British builders for £8 to £8 10s (\$37.50 to \$40), but this saving does not overcome the handicap on operating costs."

What the British Are Doing

AN INTERESTING development in the use of the diesel engine is embodied in a contract which has been concluded recently between the Donaldson Line Ltd. and Vickers Ltd., Barrow-in-Furness, England, for the construction of the first diesel engined transatlantic freight and cattle liner. The vessel will be about 400 feet in length with a carrying capacity of nearly 8000 tons cargo and several hundred cattle. She will be propelled by internal combustion engines of the Vickers standard patent, developing 3000 horsepower on a single shaft. Vickers Ltd. has under construction in its diesel workshops at Barrow several sets of internal-combustion engines for the mercantile marine, as well as for a cargo vessel for Japan and a mine-laying ship for the British government. The Donaldson line is part of the Cunard organization.

* * *

BARCLAY, CURLE & CO., a firm of Clyde shipbuilders, have acquired the shipyard formerly owned and operated on the Clyde by the Lloyd Royal Belge (Great Britain) Ltd. These works were closed down in January, 1921, as the result of the high costs of construction and the adverse rate of exchange then prevailing between Belgium and Great Britain. The Belgian company, having its headquarters in Antwerp, then stated that it had lost heavily on all its transactions in connection with the shipyard. At the time of closing down the yard employed 800 men, and four or five contracts were held with several vessels under construction. Business is being recommenced with three new vessels on the stocks. The yard is over 7½ acres in extent with a good river frontage and workshops and offices of a modern and up-to-date character.

* * *

THE Duke of Northumberland, lately re-elected president of the Institution of Naval Architects, in his presidential address took a cheerful view of the trade outlook. He thought they might look forward to a gradual trade revival since many factors were pointing in that direction.

Late Decisions in Maritime Law

Legal Tips for Ship Owners and Officers

Specially Compiled for Marine Review

By Harry Bowne Skillman

Attorney at Law

QUESTION as to when title to a vessel passes was discussed in the case of *Gaston, Williams & Wigmore of Canada, Ltd., v. Warner*, 272 *Federal Reporter* 56, and the court there said: "As between the parties, the sale and delivery of a vessel passes the title at common law. The question of registration is another and distinct matter. The registration of a vessel is not compulsory, but a privilege and advantage, of which the purchasers may or may not avail themselves as they choose." The court then held that a ship broker who procured buyers for a ship, who were accepted by the owners, and with whom a valid contract was made, is entitled to recover his commissions though the buyers could not obtain registry of the vessel under their government, and the principal alone refused to consummate the transaction for reasons personal to himself, not disclosed to the broker. It was said, too, that the shipowner must disclose to the broker a bunker agreement between it and a foreign government, which restricted its right to sell the ship, to avoid liability for payment of commissions, when the broker procured a customer ready, willing, and able to buy, but to whom the owner could not sell under the agreement.

* * *

"The custom, if such it be, of tying up one craft to another in a river, is merely a privilege," it was declared in the case of No. 225, reported in 272 *Federal Reporter* 130, "and imposes no duty upon the crew of the inner craft to make it secure enough to hold both." It was held that a charterer, which tied up a lighter to the outer boat of a tier moored to a pier, was liable for a collision caused by the parting during a high wind of one of the lines by which the boat to which the lighter was tied was secured to the next inner boat, allowing the lighter to swing around against another tier of boats.

* * *

A tug which removes a barge to which others are moored is bound, having disturbed the mooring at the time, to see to it before she proceeds, that the barges are again secured, so that no damage shall arise. The tug, having divided a towage service into two parts, for the convenience and economy of all concerned, is not relieved of responsibility during the period when the tow was laid up awaiting completion of the towage; there was owed the duty of reasonable care under all the circumstances.—*ATLAS* No. 5, 272 *Federal Reporter* 171.

* * *

Under shipping articles of seamen calling for a voyage from San Francisco to Manila for a term not exceeding six months, the seamen were entitled to their discharge on the first arrival of the

vessel at Manila, less than three months after her leaving San Francisco. Where the master, without sufficient cause, refused to pay the seamen their wages on arrival at Manila, they became entitled to double wages under the law, but where the owner thereafter paid the wages in full, he was entitled to credit for such payment against the penalty of double wages.—*Vincent v. United States*, 272 *Federal Reporter* 889.

* * *

"The primary consideration in salvage cases is the amount of benefit conferred."—*NORD ALEXIS*, 273 *Federal Reporter* 160. "In ascertaining the value of the services, it is fair to consider the difficulty of safely handling the distressed vessel and the risk run of injury to the salvaging vessel."—*WESTERN PRIDE*, 274 *Federal Reporter* 920.

* * *

The owner of a wharf at which the depth of water was insufficient to float barges at low tide is liable to a barge injured in the berth by straining of her timbers, caused by rock and coal on the bottom which had been originally soft mud, permitting barges to safely lie thereon, but had been changed in spots by the continual dropping of coal and stone; and this, though no barge had previously complained of receiving injuries while in that berth.—*GOOD NEWS*, 273 *Federal Reporter* 482.

* * *

Where a charter for the shipment of lumber has been partly executed by the ship, by the loading of the hold cargo and part of the deck cargo, a maritime lien arises against the vessel for her refusal to take on the balance of the contemplated cargo, though such balance is not in existence, not having yet been cut at the mill. Originally ships were held liable *in rem* under contracts of affreightment which were purely executory, it was held in the case of *SAIGON MARU*, 272 *Federal Reporter* 799, but that rule was at an early day so modified in this country as to hold them so bound only after actually entering upon the performance of the contract.

* * *

A tug which rendered service in preventing the spread of fire by removing from a crowded slip a boat which lay next to a burning rubbish scow, was held, in the case of *Lee v. City of New York*, 272 *Federal Reporter* 782, to be entitled to a salvage award in the sum of \$150 from the city of New York. Such award did not include the service rendered to the moved boat, which was otherwise compensated.

* * *

The master of a ship, decided the court in the case of *Peters v. Taulane*, 272 *Federal Reporter* 725, may bind the owners, through the ship; but they are

not otherwise bound, except as the law of contracts binds them, and mere ownership does not imply authority in the master to bind the owners personally unless the ship is bound. It was also held that a part owner of a vessel is not liable *in personam* for damages for the breach of an executory contract for her employment to carry cargo, when the contract was not made by him or by any one with his authority, and was made without his knowledge, and was repudiated by him as soon as known to him, and when he was not owner at the time of its breach.

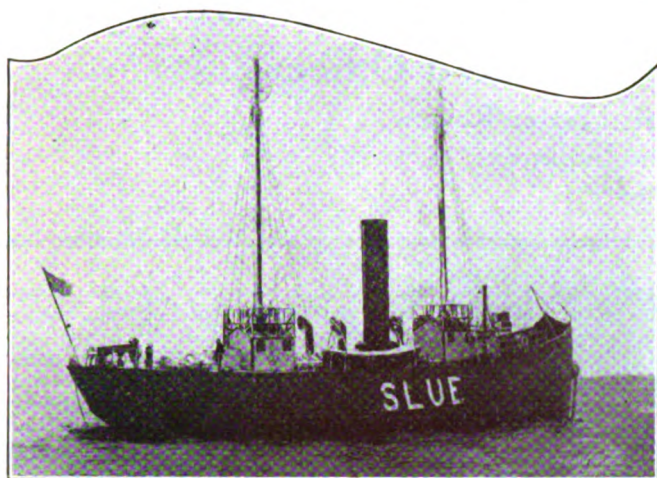
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Act of congress of Dec. 26, 1920, which provides that alien seamen found to be afflicted with certain diseases shall be placed in a hospital, and that the expenses shall be borne by the owner, agents, consignee, or master of the vessel, and shall not be deducted from the wages of said seamen, is not limited in its application to passenger vessels. "It is true," it was said in the case of *Franco v. Seas Shipping Corp., Inc.*, 272 *Federal Reporter* 542 "that, without explanation of the reasons for such legislation, it may seem unfair for the congress to impose upon the owners of ships the duty of paying hospital bills to cure alien seamen of diseases due to their own vices, but the courts," it was further said, "may not substitute their judgment for that of congress."

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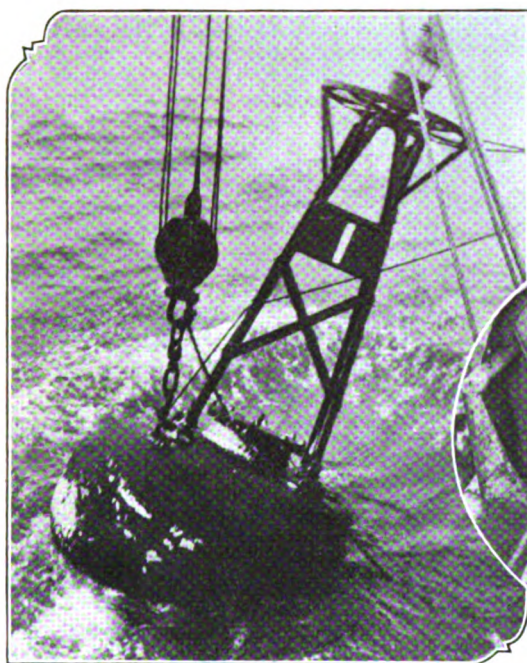
The lookout on a steamer navigating in a fog should have been posted on the forward deck, where he could perfectly well have stood, instead of on the bridge, about 100 feet aft of the stem, it was held in the case of *Adams v. United States*, 272 *Federal Reporter* 780. The court also held that for a steamer to proceed though a fog at the immoderate speed of 8 or 9 knots, which was full speed for the steamer, without a properly posted lookout, was gross fault on her part. It was further declared that the rule regarding moderate speed in a fog applies to sailing vessels as well as to steamers, although different considerations enter into the determination of what is moderate speed for a sailing vessel. With reference to the immediate case, it was held that for a schooner to carry full sail, and maintain unnecessarily a speed of approximately 6 knots through a fog, and to proceed for a period of time which, though short, was vitally important, without a lookout, and without sharply using her fog horn after she had become aware of the presence of the steamer, and to have no officer on deck in charge of her movements, and authorized to give prompt orders as the vessels approached each other, was also at fault. A decree for divided damages was entered.

Photographs from Far and Near

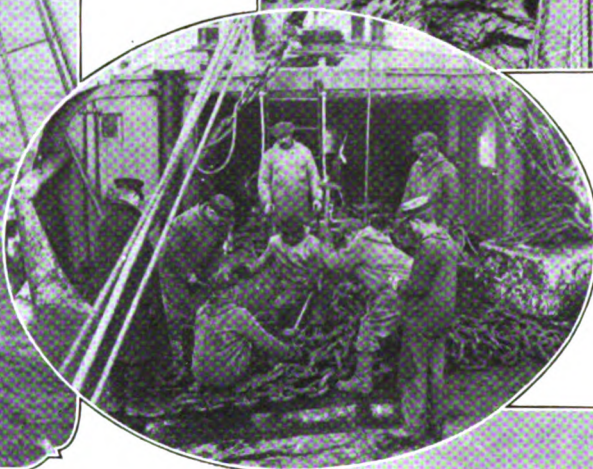


Pollock Rip Slue lightship in a snow storm

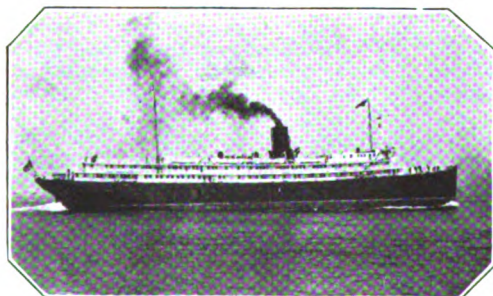
Life on a lighthouse tender calls for courage of a high order. Fastening line to ice-coated gas buoy



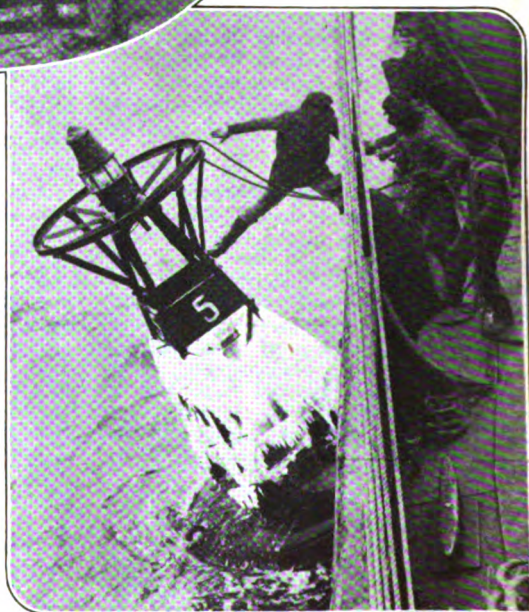
Hoisting buoy aboard after line is fastened



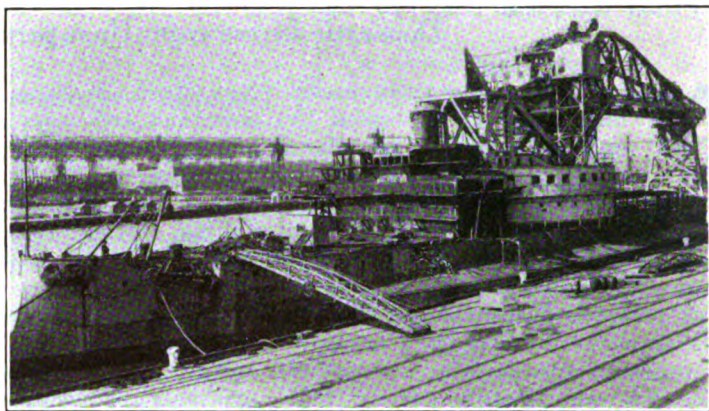
Making repairs to big chains aboard tender. Regain- ing ship after fastening line



New coastwise liner Alleghany, built by Federal Shipbuilding Co. for Merchants & Miners Transportation Co.

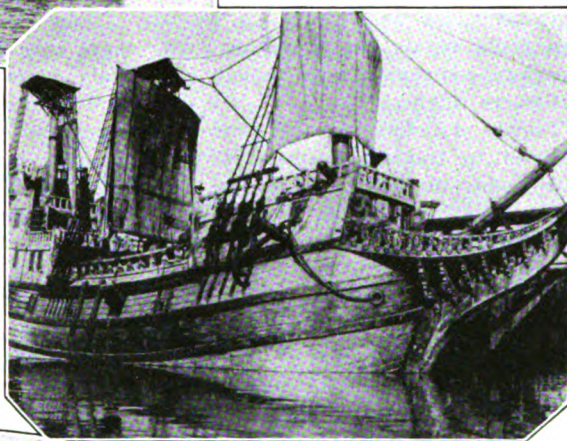


Latest Marine News in Pictures

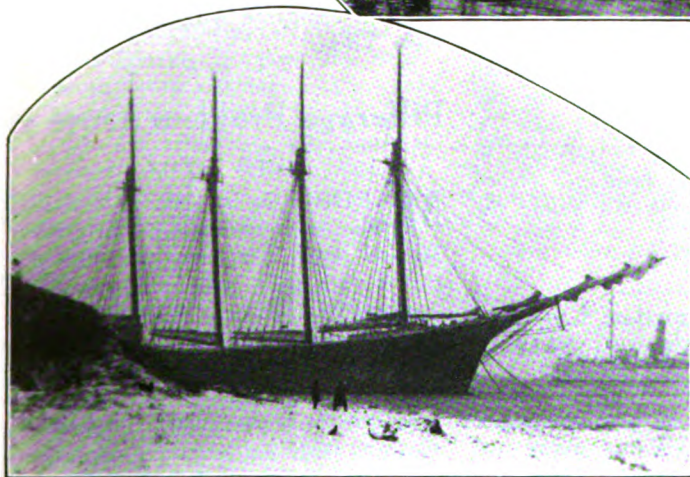


Famous old battleship Kearsarge re-equipped as crane ship. This gigantic crane is of 250-ton capacity

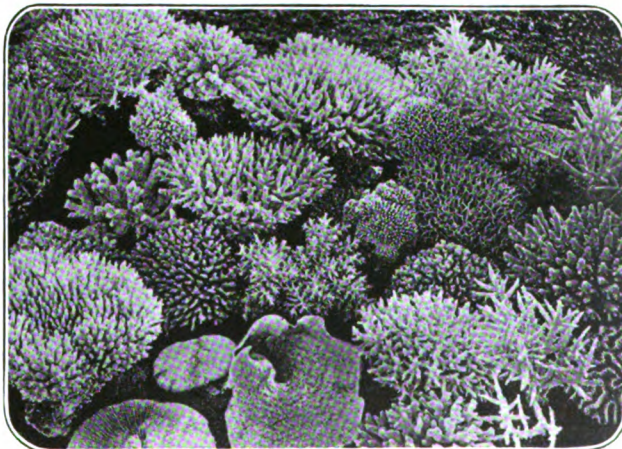
Exact reproduction of the historical Mayflower, ready to take part in a new motion picture—steel frame construction, weight 94 tons, cost \$65,000. Schooner Augusta G. Hilton (below), driven ashore on Marthas Vineyard in a gale



Capt. Herbert Hartley, commander of the world's largest liner, the American S. S. Leviathan



This resembles a flower garden scene, but actually the view was made with difficulty under water off the coast of North Queensland, Australia. In this part of the Pacific, the coral is so plentiful that the waters are called the Coral sea



N.Y. Passes Model Insurance Bill

State Legislature Approves Measure Designed to Free Domestic Firms from Unsupervised Foreign Competition

MARINE insurance has passed through what is hoped by underwriters to be its most critical stage and better times are seen ahead. Marine managers have had time to study the underwriting results for 1922 which have been filed with the state supervisory departments and base this opinion on the grounds that most of the over hanging losses have been settled and the majority of the companies that are facing 1923 conditions have started out the year with a clean slate. An indication that marine underwriters are more optimistic is shown by the report that the Aetna Fire Insurance Co. of Hartford, Conn., which withdrew from this field, is seriously considering re-entering the marine market.

The model marine insurance bill drafted by marine interests early in 1922 has been passed by the New York legislature and awaits the signature of the governor. In his annual message before the legislature, Superintendent Stoddard of the New York insurance department recommended the passage of the bill and urged that the marine market be relieved from obstructing legislation.

It is hoped that the passage of the bill will bring about a new era in marine underwriting. One of the results predicted is that it will have a checking effect upon unlicensed insurers which heretofore have been able to take business from domestic companies by writing business unsupervised and escaping the taxes imposed upon domestic and legally admitted foreign companies. In this connection, the superintendent of New York state, in his annual message says:

"One of the greatest problems which has confronted the New York state insurance department for many years has been that of unauthorized insurance. The two main causes of the demand for such insurance are lower premiums and coverage that can not be obtained from admitted insurers. The department has little trouble from the competition of unauthorized insurers from other states, the public in general realizing that there are good reasons why such insurers are not admitted to do business in the state of New York, the main reasons being that such companies are generally financially unsound according to the

New York standards. The department and companies admitted to do business in this state have, however, had much trouble from the competition of Lloyds of London, which pays no tax in this state, maintains no regular agency in New York and has none of the ordinary expenses of admitted insurers, but obtains large amounts of insurance here because it offers a coverage which our insurers sometimes can not give, at all, or can not give in one policy, and perhaps at a lower premium than domestic companies could charge for the coverage were they permitted to give it.

"I believe that by far the largest number of persons placing insurance with Lloyds of London would prefer to place such insurance with American companies and would do so if they could obtain the coverage from American companies, even though the cost were higher.

"Lloyds, London, can not now be admitted to transact business in this state under the provisions of the insurance law, but the law could, I believe, be so amended as to permit this on a sound basis and one fair to other admitted companies. The state of New York has always encouraged the entry of foreign insurers and as a result most of the foreign insurers doing business in the United States have entered through New York. Admitted insurers should not object to the entry of Lloyds, London, provided the latter is required to do business on the same basis as other admitted insurers. I believe that it will be possible to lessen the amount of insurance placed with Lloyds if the bill now before the governor is signed."

* * *

Remove Insurance Charge Against Montreal

REPORTS reached American underwriters in April that insurance rates on grain shipments along the St. Lawrence and other Canadian ports have been reduced to meet American competition. An arrangement is said to have been entered into by continental and British marine companies to meet on an equal basis the rates on grain shipped through American ports. Heretofore, rates on cargo shipments from Montreal have been higher than from New York because of the in-

creased hazards encountered on the St. Lawrence. The reduction is said to have been brought about through the efforts of C. O. Lacroix of the Anglo-Insurance Co., Montreal, who induced the British companies to remove the extra charge occasioned by the hazards of the St. Lawrence to compete with American insurance companies on an equal footing.

Competition for the export trade in grain has been keen between New York and Montreal for some time past and it appears as though the decks on both sides are being cleared for a fast and heated battle for business during the approaching season. A New York broker recently described conditions in Montreal in the following language:

"New York has many natural advantages over Montreal in developing the grain trade. The Montreal trade is limited to seven months. It also has a railroad problem. The capacity of the port just now is not much more than 500,000 bushels a day, while the closing days of the last season saw more than 1,000,000 bushels a day being offered."

A New York insurance journal commenting on the volume of business that passes via Montreal compared with New York, states that Montreal shipped no less than 154,000,000 bushels of grain compared with 128,000,000 for New York.

* * *

Pilferage Problem Acute at Vera Cruz

MARINE insurance underwriters who have returned recently from Mexico report that conditions in that country are again bad and the political fluctuations are being reflected in marine insurance records by a large increase in claims on shipments to that country. Vera Cruz, they say, has proved to be a particularly unfavorable spot and theft and pilferage losses have suddenly taken a leap upward. Goods that are passing through seem to be subjected to a systematic pilferage. Investigation has shown that the stolen goods are being disposed of by the thieves through dishonest merchants in Vera Cruz and Mexico City.

English underwriters have been active in investigating the theft and pilferage situation in Mexico and a re-

port prepared by a special committee reveals a state of affairs that shippers should well heed.

This is by no means the first time that Vera Cruz has appeared on the insurance companies' black list. This Mexican port has a habit of periodically becoming bad and then when pressure has been brought to bear clearing up. The situation is a difficult one for underwriters and some are refusing to accept any business destined to this port.

To a certain extent, theft and pilferage losses are the fault of the shipper, who too often is careless and allows his shipments to be sent out improperly packed and in cases unfit for a long journey and the rough treatment that they are subject too in handling. It is the shipper who pays the losses in the long run for the rates on theft and pilferage insurance are based on the risk involved, and if the shipper persists in careless packing it is he alone that suffers, for the companies have no alternatives but to increase the premium charge or decline to write this form of protection altogether.

* * *

Court Rules Ships Must Be Properly Dunnaged

A DECISION, recently handed down in the United States district court, southern district, New York, is of particular interest to marine underwriters. The decision held that shipowners are under obligation to furnish seaworthy vessels under the Harter act and grain carrying ships must be properly dunnaged to keep the cargo free from water damage. The suit was in admiralty brought by the Midland Linseed Products Co., against the schooner OAKLEY C. CURTIS and the France & Steamship Corp. on a libel to recover \$146,000 damages to a cargo of linseed oil transported from Buenos Aires.

The court ruled against the extension of the Harter act as contended by the respondents to the effect that they warranted the seaworthiness of the vessel in so far only as ordinary care can provide and that the vessel was relieved only from liability arising from an act of God, perils of the sea, etc. It was shown that the hull was entirely seaworthy but that the trouble lay with her dunnage which was improper and insufficient.

As regards water coming in the sides, the respondents were deemed liable for damage from such cause, since

it was shown that if the 'tween deck and the lower hold had been properly properly dunnaged, the water would have passed into the bilges and would have been pumped out.

* * *

Foreign Companies Show 1922 Was Poor Year

THE year 1922 will not go down in the annals of British marine insurance as a banner year according to the statements of British companies that have so far reached this country. London underwriters have been faced with a difficult situation due to the stagnation of shipping and for the most part companies show a decrease in premium income over preceding years and a high loss ratio. Danish companies trod a stony path and during the year just passed, no less than 19 ceased to do business. Three new companies were started. It is interesting to note that of 111 Danish companies, only 36 were in existence prior to the world war. The period following the war has seen 45 companies with a combined capital of 80 million kroner, go out of business.

* * *

Market Now Calls for Caution on Rate Changes

THE rate situation has been likened by an underwriter to the stock market in the bull days of 1920 just preceding the break. In those days most of the followers of the stock market knew that it was getting top heavy yet each day a new high figure would be reached. Likewise, the marine market in many particulars has reached a point where the better judgment of all thinking underwriters tells them that they should not attempt to continue writing certain lines at current rate or cut others merely to gain business that will not be profitable.

Large Size Oil Engines

(Concluded from Page 172)

Normal operating speed, revolutions per minute 180
Rated brake horsepower—total for two engines 2504

One of the most important features of this proposed installation is the elimination of the compressor and scavenging pump from the main propelling engines, for which the following advantages are claimed:

1. The entire power developed by the working cylinders of the main engines

is applied to the propulsion of the ship.

2. Simplicity and consequent reliability.

3. Length of engine room is kept down to a minimum, being only 54 feet for the 6000 shaft horsepower installation.

4. The independent compressors and scavenging turbo-blowers may be shut down for inspection and adjustment without stopping the main engines.

Three turbo-blowers, each directly connected to electric motors furnish the scavenging air for the two main engines and the two auxiliaries. Each turbo-blower has sufficient capacity to furnish the required amount of scavenging air for one of the main and one of the auxiliary engines, thus allowing for one turbo-blower set in reserve. The extended forward end of the crankshaft of each of the auxiliary engines, drives a duplex air compressor directly connected, of sufficient capacity to supply the injection air for the two main engines and one auxiliary engine and for recharging the starting air tanks. An oil pump is also directly connected to the forward end of each crankshaft, extended, and each pump is of requisite capacity to supply the oil for the two main engines and one of the auxiliary engines.

The after end of the crankshaft, extended, of each auxiliary engine, drives a 500-kilowatt direct current generator, supplying current to the motors driving the turbo-blowers, and to the auxiliary pumping machinery while at sea and to the deck machinery and auxiliary pumping machinery while in port. In addition to the above, the following auxiliaries are included in the engine room equipment:

	Capacity, gallons per minute
Two jacket cooling water pumps	895
Two piston cooling water pumps	180
Two fuel oil supply pumps	290
One fuel oil transfer pump	300
One sanitary pump	200
One bilge pump	300
One ballast pump	800
One deck and fire pump	400

In general, this installation incorporates improvements and refinements developed during the course of a long period of practical experience. Beginning with smaller units, sizes have gradually been increased up to the point of the installation under discussion, which is the maximum thus far attempted. It is significant, however, that progress has been logical in that the performance of each preceding engine has been carefully studied and the accumulated knowledge so gained, fully applied to the next. The evolution to the larger sizes is, therefore, based on safe and sound principles. Due credit should be accorded each manufacturer for his contribution toward the perfection of the marine oil engine.

Use New Method in Making Rope

Manufacturer Develops Rope of New Type Which
Has Been Tested to Show Increased Strength

BY WALTER L. FAUST

A PROBLEM in the cordage industry that has seemed almost impossible of solution has at last been worked out after years of study and research. Improved efficiency, greater strength and other valuable qualities in large cordage construction are claimed for a new rope structure recently developed and covered by basic patents by the Whitlock Cordage Co., New York.

This new kind of manila rope is developed to effect a large saving per year for those engaged in the business of marine transportation, cargo handling, construction and power transmission. It is intended to assist ship-owners, operators and engineers, who are today striving as never before to cut down costs.

Before describing the new, a brief review of the old should be made. In starting, the bale of fiber is opened and the hanks fed through various machines functioning to comb the fiber into a continuous ribbon known in the trade as "sliver." This process is continued until the ribbon or sliver is uniform and of the proper size for spinning. It is then sent to machines known as "jennys" which spin the sliver into yarn. This yarn, wound on bobbins, is then sent to the "formers"—machines which "form" or twist the yarns into a strand. Keep in mind the fact that the strand is made up of layers of yarns twisted around one another. The yarns composing the outer layers are known as "cover" yarns, while all yarns below this layer are designated variously as "center," "inner," or "inside" yarns. These strands are then "laid" (twisted around one another) to form the finished rope.

With this brief description of the ordinary rope structure in mind, the next step will be to examine the manner in which the forces to which rope are subjected act upon the component parts of the rope. The theoretical basis for any discussion of this type would be the curve known as the helix.

It is not, however, the purpose to go into any mathematical, technical details, but rather to present this phase

by easily pictured analogies and in the simplest possible manner.

For this purpose then, the helix may be visualized in the form of a coiled tension spring. If you will picture a number of tension springs of decreasing diameters, but of equal pitch, coiled concentrically (one within the other) you have a fairly accurate idea of the various layers within a strand of ordinary rope. To simplify matters, a strand only is being considered, and not the rope as a whole. Holding one end of each concentric spring in one hand, imagine yourself extending the set of springs by pulling out on the other set of ends.

How Rope Strain Is Met

The spring in the center, being of the smallest diameter, will have the least length of wire, and will be the first to pull out straight for its entire length. No further extension of the outer springs can be made until the wire of this center spring has broken and released your pulling hand. The further progress of your pulling hand will be arrested by the next spring straightening out. This second spring broken, you proceed to the third and so on to the last, or outer spring. You have now proved to yourself the truth of an important theory which has apparently not been recognized in the rope industry, that the yarns in a strand do not pull as a unit but rupture successively layer by layer, beginning with the shortest inner yarns.

Now that the problem has been stated, turn to the cure. Knowing that the ordinary rope, of a size large enough to contain "inside" yarns, is comparatively inefficient, the problem facing Whitlock engineers was so to construct larger sized ropes that they would be relatively as efficient as the smaller sizes in which all the yarns pull evenly and work at maximum efficiency because there are no inside yarns.

This type of rope, known as "fibore" was invented by Herbert V. Whitlock. It substitutes for the center yarns, a core composed of unspun hemp, giving as a strand structure a core with practically no twist and a protecting sheath of yarns.

This type of construction is designed to enable the user, for many

kinds of work, to employ a smaller size than he has ordinarily used, thereby effecting a decided saving. In cases where the same size is used, the new rope is to provide an increased factor of safety. A study of the structure outlined above will also show that the advantage of this construction increases with the diameter of the finished rope.

In the manufacture of this type of rope, the proper number of "spinning slivers" previously referred to are united to form one large sliver duplicating in weight the center yarns replaced. These combined slivers are then fed as a unit, unspun, to the former and the cover yarns placed around them. The strand made in this manner differs from the strand composed wholly of layers of yarns in that the fibers constituting the core are all practically of the same length, parallel to each other, and parallel to the axis and to the direction of loading of the strand.

In the service rope renders, there are six salient requisites, tensile strength, life, ease of handling dry and wet, amount of permanent stretch and elasticity. A study of this new type of rope structure as compared with the old in each of these subdivisions of service, follows.

The spring analogy considered above will again bring to mind the fact that instead of successive layers of yarn taking the load in turn, due to their difference in length, the strand now must act as a unit from start of pull to rupture. This new type of strand may be visualized as a bundle of wires all practically of the same length with a protecting cover of wires wound helically around them to take the abrasive wear.

Durability or "life" of rope—excluding all exterior conditions—is largely due to two distinct factors; first, quality of fiber, and, second, internal friction which causes wear and eventually a complete breaking down of the inner parts of a rope. The first factor, of course, affects both types of rope structure. In the case of the second factor, however, with the new structure all friction occurs between fibers parallel to each other and is caused by fiber slipping over fiber in the direction of their length. With the old type of rope, yarn is rubbed

The author, Walter L. Faust, is of the technical staff of the Whitlock Cordage Co., New York.

against yarn and hence fiber across fiber and not along fiber. No lubricant can hope to prevent the wear, or rather tear of fibers ripping across each other as in the case of yarn along yarn; but a good lubricant can almost remove the friction of smooth fiber along smooth fiber.

If in bending the rope you are merely sliding fibers, smoothly over adjacent fibers, less effort is required than in pulling yarn over yarn and you naturally have an easier handling rope. This accounts for the claim of greater flexibility for the new rope. There is also a freedom from the effects of variable twists in yarns and similar factors.

Ease of Handling when Wet

When a yarn becomes wet it has a strong tendency to untwist. If the yarn is restrained from this untwisting, as it is when a part of the regular rope structure, it must relieve itself in some manner. The result is apparent in a swelling of each yarn and, therefore, of the whole rope, and in a distinct hardening or compacting of each strand—which means a stiff handling rope. Thus, with its core of unspun fiber, the new rope has largely eliminated this trouble—the stiffening that occurs is due principally to cover yarns.

A definition of the two terms "stretch" and "elasticity" as applied to rope would not be amiss at this point. Stretch designates the amount of permanent elongation in a length of rope. It is stretch that forces resplicing of transmission rope. Elasticity, on the other hand, is the temporary elongation of a length of rope under load, the rope returning to its original length upon release of load. It is elasticity which gives a hawser "seaway" in bad weather and absorbs the shocks of varying load in a transmission line.

Engineers who developed the new rope point out that in the case of the old, all-yarn type of rope, when load is applied the twist draws out in each yarn and each yarn becomes longer thus giving considerable permanent stretch and extremely little elasticity. The lack of elasticity is due to the fact that the yarns in elongation are forced to give up some of their twist (the pitch of the helix increasing) which can not return due to the fact that they are constrained in their untwisted position—also due to the fact there is no force tending to retwist them. This result is apparent in an old so-called "lifeless" rope in which the yarns are found to have extended to their limit.



STRUCTURE OF OLD (LEFT) AND NEW (RIGHT) TYPES OF ROPE

The new rope is said to perform in an entirely different manner. Here smooth straight fibers lie parallel to each other, all extended to their full length. There being no twist to come out and no constriction of these fibers, the result is little or no stretch. Keep in mind that contrary to a more or less popular impression, the fiber itself has practically no stretch.

One might suppose that if there were no stretch there would be no elasticity. However, stretch is a function of the strand while elasticity is a function of a plurality of strands. By that it is meant that stretch is a result of the untwisting of the yarn helices which are then held in the untwisted condition in the strand—while elasticity results from the compressibility of strand on strand when layed up and the free unlaying or untwisting

of the strand of the finished rope. Both of these last operations are freely reversible and impart to the rope the "give" that is so desirable.

The new rope has noticeably more springiness which is to be expected when one considers that the center of the strand has changed from a composite of twisted yarns to a composite of straight smooth fibers. The strand itself then adds to the elasticity as its reflex action is now practically unconstricted.

Ease of Splicing

As this new structure is a unit in the strand and as short splices are made without dividing the strand, in this case it will splice exactly in the same manner as ordinary rope. For a tapered splice, the core may be decreased in size, tuck by tuck. For

long splices, where a division of the strand unit is required, one finds the fiber core easily divisible.

Company engineers report that this rope on numerous tests has proved itself from 10 per cent to more than 30 per cent stronger than rope of ordinary construction, size for size, grade for grade and weight for weight. These advantages of the new style rope increase with the size.

Steam Power and Heating Plant for Small Ships

A small and compact steam-generator plant has just been invented and patented by E. H. Vincent, Oakland, Cal., for use in supplying light and heat to small vessels, and to replace donkey engines and man power on winches, capstans and similar deck work. The plant consists of a high-pressure, superheated-steam engine of 3-cylinder type, to which steam is supplied from a boiler containing 256 tubes, and heated by an oil burner. The boiler is so constructed that any tube may be removed for repair or replacement, without disturbing the other tubes. The engine is direct-connected with a Westinghouse motor-generator and generator.

The experimental plant constructed and now in operation, has a capacity of 450 lights, furnishes steam heat and hot water in quantity, and can be operated, it is said, at a cost of ap-

proximately 1½ cents per horsepower hour, or 35 cents per hour for the 22-horsepower plant. This rate has been reduced considerably in some of the experiments. It is claimed that this plant, operating with steam superheated to 700 degrees, is cheaper in operation than the plant of the same capacity, whose motive power is an internal combustion engine.

The plant is being built at present in two sizes, to generate 15 and 30 kilowatts, either alternating or direct current. Experiments are claimed to show that the steam plant will furnish light, power, heat and hot water, at less cost than the non-steam plants will furnish light alone. The exhaust supplies the hot water and, by using the condenser and the gases from the fire-box, heat, steam or hot water for heat is supplied.

The plant is started by throwing in the switch connecting a 12-volt battery with a 12-volt motor generator, which operates a fuel, air and water auxiliary. This auxiliary runs continuously, supplying water to the steam generator, and by-passing it, at a predetermined water level. The fuel is atomized at 160 pounds pressure, and directed into the combustion chamber through a space also admitting air, which is supplied in sufficient quantity and a proper pressure by a fan located between the radiator condenser and the steam-generator unit. The air is carried into a chamber sur-

rounding the steam generator and the combustion chamber, where it is warmed, and then sent on into the combustion chamber where the mixture of air and atomized oil is ignited by an electric spark.

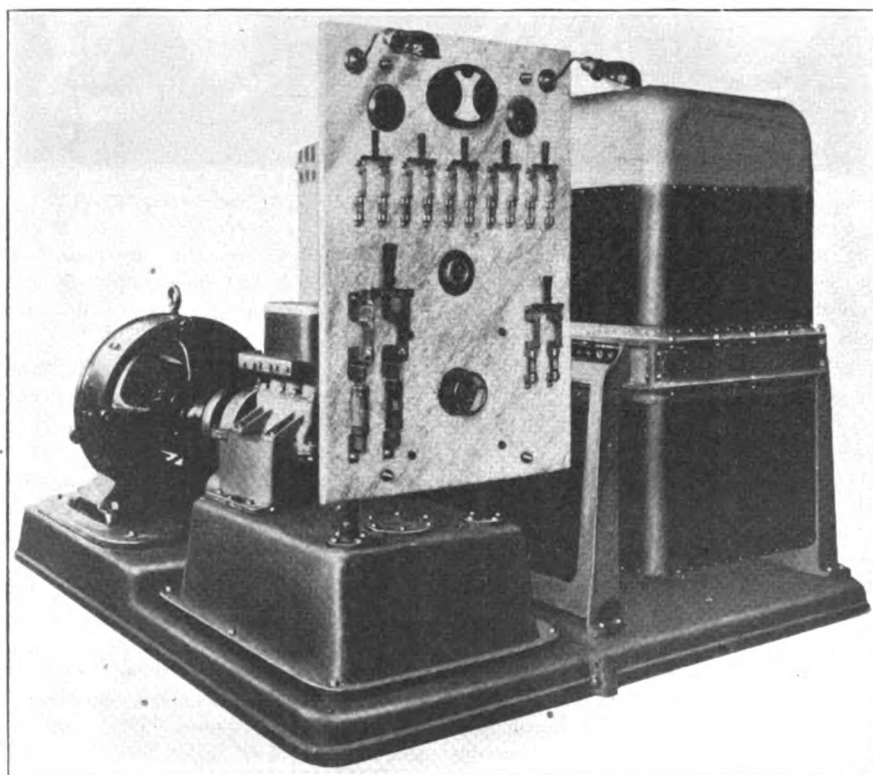
When the working pressure is reached, the fuel is cut off and the air deflected, both operations being performed automatically. When the pressure drops 25 pounds, the burner is lighted again, and the air deflector closed, also automatically. The variance of the load is cared for by a governor on the engine. The time required to start the engine, when cold, with cold crude oil, is less than one and one-half minutes, and the inventor believes that this can be reduced to one minute.

These plants eventually are to be built in sizes from 5 to 100 kilowatts. The entire plant is controlled from a switchboard, as shown in the illustration. The 15-kilowatt plant is 5 feet 1 inch in height, 6 feet 9 inches wide, and 7 feet 2 inches long, thus occupying 48 square feet of floor space. This plant furnishes 400 lights, and heat and hot water sufficient for the galley and the use of 200 persons, an average of 100 staterooms. The plant also can be used to supply power to electric refrigeration plants in any part of the ship, and will furnish power for a number of electrically driven winches, deck hoists and similar cargo handling equipment. It is also to be installed experimentally as the power plant of a small tug.

Boston Shipping Market Gains Strength

Conditions at the port of Boston continue to show improvement. Freight both in and outbound on the South American lines has been unusually heavy. Egyptian cotton has helped keep sailings on the Mediterranean service fully up to schedule. The falling off in import coal at Boston has been felt by some shippers, but this is partially offset by increased coastwise traffic. Coast to coast lines all report increased tonnage in April. Boston has obtained increased passenger service through the new White Star line direct to Queenstown and Liverpool and the United States lines service between Boston and Cherbourg and Bremen, both of which have recently started.

FREDERICK A. KIRK is now with C. H. Sprague & Son, Boston, having charge of the Scandinavian service of this concern. Mr. Kirk comes from New York where he has long been identified with shipping interests.



LIGHTING, POWER AND HEATING PLANT DESIGNED FOR USE ON SMALL VESSELS

Stuffing Box Should Be Standardized

Standardization in shipbuilding and the shipping industry is desirable from the standpoint of convenience as well as economy. Why have a dozen or more different varieties of containers for a piece of apparatus that goes into the same place? Emphasis should be particularly directed to the standardization of important parts of main equipment where such standardization can be accomplished without revolutionary changes and at a comparatively low initial cost.

Metallic packing plays a part of utmost importance in machinery on shipboard and it lends itself readily to the application of the principles of standardization. Many different kinds of metallic packing are manufactured but all kinds must be so made that they can be fitted and properly secured in place about any moving rod or shaft. In other words, the metallic packing is contained in stuffing boxes or glands which fit the different diameter rods, and are secured with bolts to the cylinder casting.

Variations in the dimensions of the glands or stuffing boxes for the different makes of packing is a source of expense and great inconvenience to the shipowner. If for any reason it is desired to change the type of packing, as a rule considerable machine work has to be done before the shift can be made. In case of an emergency where it is necessary to make a change in packing on account of availability or lack of it, or other reason, this nonuniformity in the gland dimensions may involve delay and expense out of all proportion to the first cost.

For something concrete and tangible to work on in the matter of standardization, the metallic packing container, stuffing box or gland can not be excelled both from the point of view of importance and feasibility of accomplishment.

Robert P. Jones, manager for the France Packing Co., 30 Church street, New York, in his capacity as secretary-treasurer of the Marine Engineers Supplymen's association, recently submitted recommendations on request, to the department of commerce for standard stuffing box dimensions for metallic packing. These recommendations are embodied in the accompanying table of standard sizes based on piston rod diameter.

That the standard sizes set down in this table will meet with the uniform approval of all the metallic packing

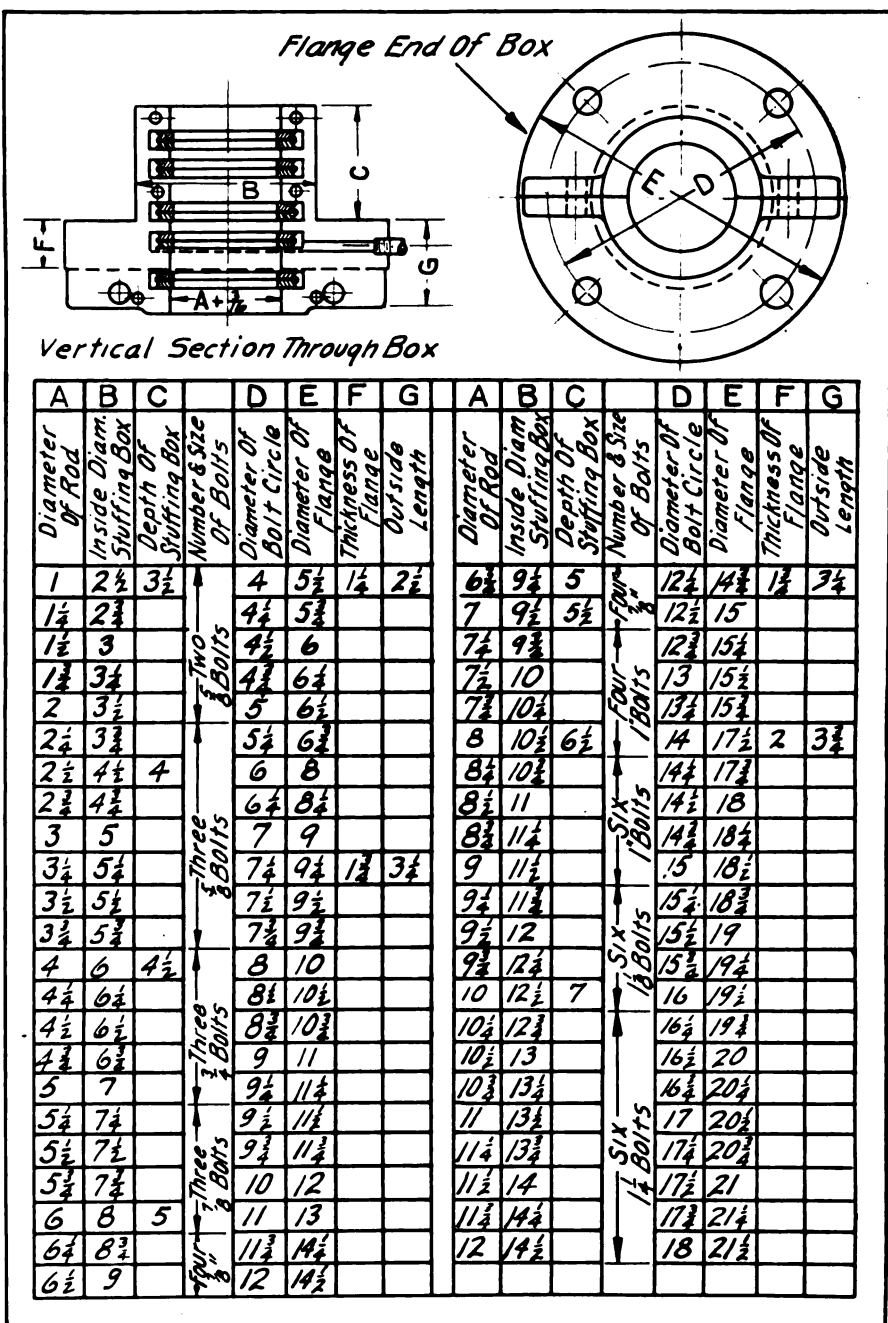


TABLE OF DIMENSIONS OF STANDARD SIZES OF STUFFING BOXES

manufacturers throughout the country is improbable. But this is, however, a step in the right direction and a uniform set of dimensions can and should be agreed on between all the manufacturers. The shipowner is interested and would welcome standardization.

W. C. Conwell, for some weeks has not been associated with the Sturgeon Bay Dry Dock Co., Sturgeon Bay, Wis., of which he was manager.

The shipping board has sold the 6000-ton steel floating drydock, built by the Ramberg Drydock & Repair Co., to the Atlantic Works, Boston. The purchaser expects to tow the dock from Brooklyn to Boston the next few weeks,

thus giving the port of Boston additional drydocking facilities within the near future. This sale disposes of the one steel floating drydock belonging to the shipping board and leaves available for sale only the following five drydocks: Three 10,000-ton wood floating drydocks located in New York harbor; one 10,000-ton wood floating drydock located near Providence, R. I.; one 6000-ton wood floating drydock located at Jacksonville, Fla.

Albert W. Honywill Jr. has severed his connection with the Terry Steam Turbine Co., Hartford, Conn., to take up new duties as assistant to the president of the Diamond Power Specialty Corp., Detroit.

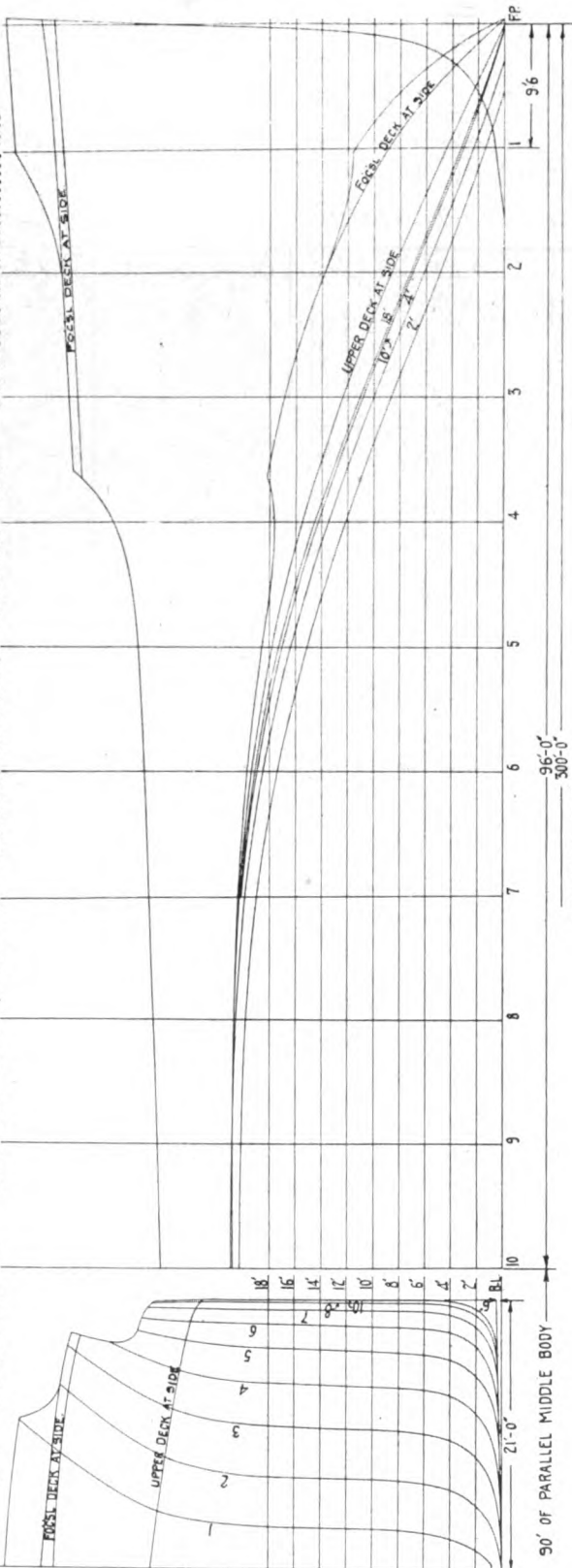
LINES FOR PROPOSED DIESEL-ELECTRIC PASS. CARGO SHIP.

L.B.P. 300'-0"
 LOAD DRAFT 18'-0"
 DEPTH MLD. 21'-6"
 BEAM 42'-0"

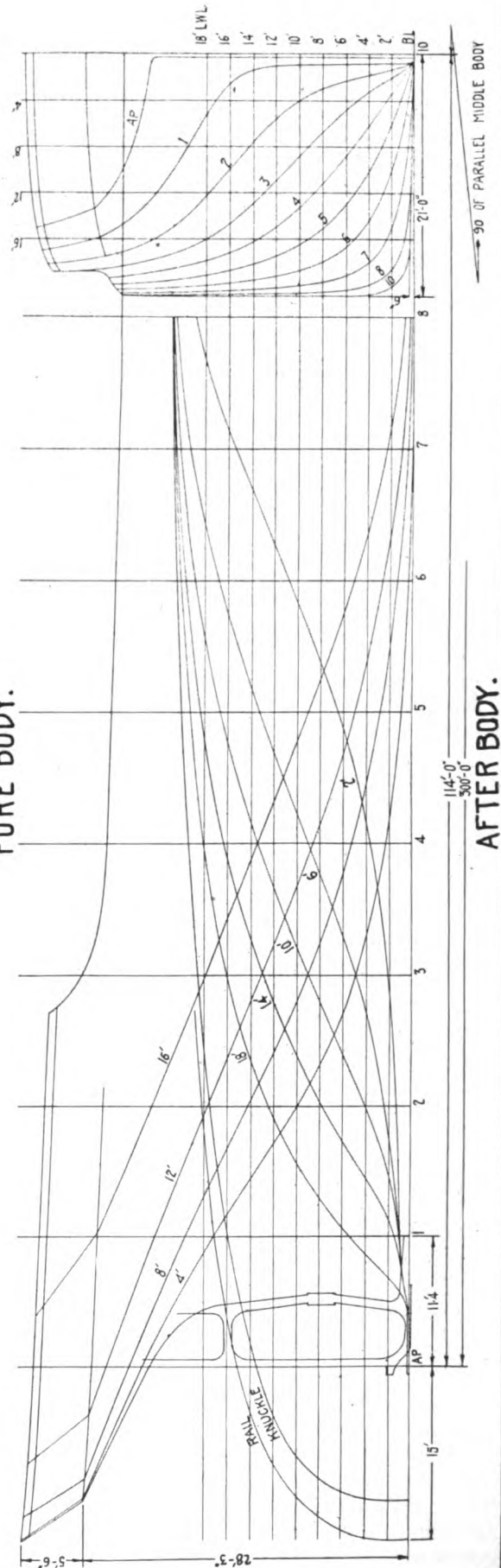
MIDSHIP SECTION COEF.98
 LONGITUDINAL COEF.75
 BLOCK COEF. 735 L.W.L. COEF. .804

LENGTH OF PARALLEL MIDDLE BODY 90'-0"
 LENGTH OF ENTRANCE 96'-0"
 LENGTH OF RUN 114'-0"

ENTRANCE RUN
 LONG. COEF.675
 L.W.L. COEF.691



FORE BODY.



AFTER BODY.

SUGGESTED COMBINATION CARRIER OF A TYPE NEEDED TO MEET DEFICIENCY IN AMERICAN MERCHANT MARINE

Proposed Diesel-Electric Vessel

Passenger and Cargo Ship of Original Design and Type in Which American Merchant Fleet Is Deficient

BY A. H. JANSSON AND T. A. GAMON

ON THE principle that a definite, tangible proposal, incorporating comparatively new features and departures from the ordinary or usual design, best represents a basis or center on and about which analysis, discussion and criticism may rest and revolve in furthering and developing mechanical efficiency and suitability of vessel type for the American merchant marine, the accompanying design is presented. It was decided that this definite proposal should if possible cover a type of ship useful in certain trades and a type in which the present large merchant marine is noticeably deficient. In the building up of close and cordial relations between nations which may mutually benefit in the interchange of commodities, no element is stronger than the efficient, well manned and officered ship. The service contemplated is that of a passenger and cargo vessel maintaining a schedule of sailings between such ports as New York, Boston, Baltimore, Norfolk or Savannah and any one of several of the smaller ports in Cuba, or to Porto Rico, Mexico, Central America, northern coast of South America or the Bahamas. The vessel is fitted in other words to enter into trade for cargo and at the same time to provide regularity in opening up passenger communications in ports not favored or fully covered in this respect.

The basic or operating ideas on which the present design was built are cargo capacity, limited draft and passenger accommodations. A large ship (up to a certain limit) is more efficient in overall operating expense than a small ship. Large cargoes in certain trades can not be obtained without delay or not at all, which more than makes up for the lesser cost per ton for carriage in the larger ship. Therefore, it was decided to limit the cargo carrying capacity to 3000 deadweight tons, an amount obtainable in a short time at regular and comparatively short intervals. Certain points from which cargoes are offered are limited in depth of water. On account of this fact, load draft was limited to 18 feet.

Offering, by means of carriers of freight, a steady reliable and pleasant mode of communication for travelers and business men, is of the most direct value in establishing good will and spreading correct information and impressions which inevitably lead to better understanding and increased business. Partic-

ularly important is this fact at ports of the smaller countries which do not warrant the use of large express passenger liners. It was, therefore, decided to provide comfortable accommodations for 24 passengers. The three considerations above have entered into the design illustrated in the accompanying drawings.

Design of Hull

The design proper may be divided into two major divisions, the hull and the choice of motive power. Irrespective of the motive power it is of course essential to design around the limiting factors, in this case draft and deadweight which in turn limits the displacement, the most efficient hull possible. After a thorough analysis of a series of combinations of draft, beam and length with a speed of 11 knots, to give the required deadweight and displacement the following dimensions were fixed: Length between perpendiculars 300 feet; beam molded 42 feet; load draft 18 feet.

With these characteristics determined an exhaustive study of distribution and shape was made for minimum resistance. A great number of effective horsepower curves were worked up from standard model experiments based on various combinations of midship section, water line and sectional area coefficients, percentages of parallel middle body, and distribution of parallel middle body with respect to the midship section. In this manner by a process of elimination the fundamental hull characteristics were determined to give the maximum results in displacement with a minimum resistance and a determination thus made of the effective and consequently the shaft horsepower required for the speed desired.

To place less power in this particular hull would be to underpower and to place more power with the view of greater speed would be equivalent to making undue and uneconomical sacrifices of power for the additional speed. It is to be borne in mind that a properly designed hull has one point and only one of maximum efficiency. To use greater power for increased speed in good design presupposes a redesign of the hull altering its dimension and characteristics and shape to suit minimum resistance conditions for the speed desired. As far as possible in a theoretical design and without the corroborative evidence of actual model experiments, the dimension characteristics and shape settled on for

this hull represents the utmost in economy for the conditions set and this in turn means a minimum of power and the greatest saving possible in fuel consumption for any type of motive power.

Having settled on the determining characteristics, they were accurately and fairly maintained in the actual development of the lines by use of Taylor's mathematical formulas, so that the lines on page 188 represent exactly the conditions formulated. This method has been used for the production of the lines of ships of war and auxiliaries for the United States navy since its origin by Admiral Taylor 14 years ago. As far as known mathematical lines have seldom been used for merchant work.

In general, the vessel represented in the drawings is of the two-deck three-island, single screw schooner rigged type with a fairly long bridge and an additional deck for accommodation of the passengers. Adequate cargo hatches and cargo handling gear has been provided. With a view to comfort for both the crew and passengers, no quarters are provided for in the bridge space proper. Excepting the after end, this space may be used for light cargo handled through side ports and through bridge bulkhead doors. All accommodations are marked on the insert with individual numbers and the accompanying table indicates what each space is used for.

Motive Power

From the power and resistance data developed in the hull design, for a speed of 11 knots fully loaded, a shaft horsepower of 1200 was found necessary. With complete freedom of choice limited only by due regard for all around mechanical efficiency, reliability, flexibility, convenience and least cost when taking into account upkeep, fuel economy and continuity of service, it was decided to adopt the diesel electric drive using two diesel engines, each driving a direct generator. The electric current so generated is to be used in driving a single direct current motor, directly connected to the shaft turning the propeller.

Engine Data

Two 2-cycle diesels at 180 revolutions per minute, 750 brake horsepower each.

Electrical Data

Two direct current generators, direct-connected, 500 kilowatts each.

Two exciters, direct-connected to gen-

erator, 20 kilowatts each.

One double armature motor, direct-current developing 1200 brake horsepower at 80 revolutions per minute.

Motor connected directly to propeller shaft.

Propeller Data

Shaft horsepower	1200
Revolutions per minute	80
Wake (w)	0.32
Speed of advance in knots (Va) .	7.48
Diameter (d), feet, inches	14-4
Pitch (p), feet, inches	13-9
Efficiency (e), per cent	59
Speed of ship in knots	11

Information concerning the diesel engines was furnished through the courtesy of the Busch-Sulzer Bros. Diesel Engine Co., and for the electrical equipment by the General Electric Co. Equal results may be anticipated by the use of any other high grade oil engines and marine electrical equipment.

Main Drive

Reasons for choice of oil engines are obvious as the fuel consumption is not over 0.45 of a pound per horsepower hour, or only 45 per cent of that of the most efficient steam drive. In choosing two engines instead of one, the following advantages are gained:

1—Smaller units highly developed and thoroughly proved in service.

2—Assurance of continuous power. One engine can be overhauled and repaired while the other is running.

3—Interchangeability of parts, even to the extent of using the parts of one engine for repairing the other in case of an emergency.

4—Parts are light and can be easily handled by the engine room crew, so that repairs can be made at sea.

5—Elimination of any auxiliary sets except a small lighting set. One of the main engines can be used in port for deck machinery, and at sea current can be taken from the main drive for all auxiliaries.

Taking advantage of present engineering knowledge and development, the ultimate motive power for the truly economical ocean freighter is the diesel electric. In this design, it was, therefore, decided to use electrical transmission of power from the diesel engines to the propeller, and by so doing reducing the revolutions of the engines for best economy (180 revolutions per minute) to 80 revolutions per minute for the electric motor driving the propeller. There is consequently an important and direct saving in propulsive efficiency as the propeller runs at the revolutions corresponding to maximum efficiency. In this day of universal use of electrical machinery for power, it may be stated without fear of reasonable contradiction

Reference Table to Special Supplement

BOAT DECK

- 1.—Pilot house.
- 2.—Chart house.
- 3.—Captain's bath.
- 4.—Captain's stateroom.
- 5.—Captain's office.
- 6.—Hospital.
- 7.—Hospital.
- 8.—Wireless installation room.
- 9.—Stateroom—two wireless operators.

PROMENADE DECK

- 10.—Social hall.
- 11.—Purser's office.
- 12.—Stateroom—two passengers.
- 13.—Toilet and bath.
- 14.—Ladies' toilet.
- 15.—Stateroom—two passengers.
- 16.—Toilet and bath.
- 17.—Stateroom—two passengers.
- 18.—Stateroom—two passengers.
- 19.—Stateroom—two passengers.
- 20.—Toilet and bath.
- 21.—Stateroom—two passengers.
- 22.—Smoking room.
- 23.—Men's toilet.
- 24.—Toilet and bath.
- 25.—Stateroom—two passengers.
- 26.—Toilet and bath.
- 27.—Stateroom—two passengers.
- 28.—Stateroom—two passengers.
- 29.—Stateroom—two passengers.
- 30.—Toilet and bath.
- 31.—Stateroom—two passengers.
- 32.—Store room.
- 33.—Toilet and bath.
- 34.—Stateroom—two passengers.

BRIDGE DECK

- 35.—Chief engineer's stateroom.
- 36.—Chief engineer's toilet and bath.
- 37.—First assistant engineer's stateroom.
- 38.—Second assistant engineer's stateroom.
- 39.—Third assistant engineer's stateroom.
- 40.—Stateroom—two junior engineers.
- 41.—Stateroom—three cooks.
- 42.—Engineer officers' mess.
- 43.—Engineer officers' bath.
- 44.—Engineer officers' water closet.
- 45.—Galley.
- 46.—Pantry.
- 47.—Steward's stores.
- 48.—Deck officers' water closet.
- 49.—Deck officers' bath.
- 50.—Deck officers' mess.
- 51.—Stateroom—two stewards.
- 52.—Stateroom—steward.
- 53.—Third officer's stateroom.
- 54.—Second officer's stateroom.
- 55.—Pantry.
- 56.—Purser's stateroom.
- 57.—Chief officer's toilet and bath.
- 58.—Chief officer's stateroom.
- 59.—Dining room.

POOP DECK

- 60.—Quarters—two pantrymen, four waiters, three mess men and one mess boy.
- 61.—Deck crew's mess.
- 62.—Deck crew's showers.
- 63.—Deck crew's water closet.
- 64.—Engineer crew's water closet.
- 65.—Engineer crew's showers.
- 66.—Engineer crew's mess.

UPPER DECK

- 67.—Bos'n and carpenters' toilet and showers.
- 68.—Laundry.
- 69.—Paints and lamp room.
- 70.—Quarters, bos'n and carpenter.
- 71.—Carpenter shop.
- 72.—Cargo space.
- 73.—Refrigerating machinery.
- 74.—Meat room.
- 75.—Vegetable room.
- 76.—F. W. tank.
- 77.—Steward's stores.
- 78.—F. W. tank.
- 79.—Escape trunk.
- 80.—Quarters—two electricians and one deck engineer.
- 81.—Quarters—three oilers.
- 82.—Quarters—two quartermasters.
- 83.—Steering gear room.
- 84.—Quarters—three wipers and one fireman.
- 85.—Quarters—seven seamen.

that it affords the most dependable motive power which has ever been used for both main drive and auxiliaries for vessels. Dependability then, the most important item in connection with the successful operation of a ship, is assured by the use of two diesel type oil engines of comparatively small size each directly connected to a generator, the current so generated furnishing power to a single double armature, direct current motor directly connected to and driving the propeller shaft.

It is of course true, deducting for the losses in the electrical conversion of power from the diesel engines that the theoretical economy suffers. These losses may be calculated based on fair assumptions as follows:

Diesel Electric Drive

Fuel consumption for the 750 brake horsepower diesel engines is 0.45 pounds per horsepower hour.	
Efficiency of generators, per cent..	93
Efficiency of motor at 80 R.P.M., per cent	91
Combined efficiency of electrical units, per cent	84.5
Propeller efficiency as designed for 80 revolutions per minute, per cent	59
Fuel consumption, tons per day for diesel electric drive, 1500 B.H.P.	7.23

Diesel Single Engine, Direct Connected

Propeller efficiency as designed for 120 revolutions per minute, per cent	53.5
Equivalent B.H.P. for single diesel engine	1397
Fuel consumption for a 1397 B.H.P. diesel engine is 0.43 pounds per horsepower hour.	
Fuel consumption, tons per day, single diesel engine direct connected	6.44
Gain in fuel consumption over two diesel engines and electric drive, per cent	11

Using electrical transmission, therefore, involves on the basis of perfect equality in operation a theoretical loss of 11 per cent in fuel consumption. This loss as stated is a theoretical one as the supposition of perfect equality in operation does not exist. In heavy weather and in maneuvering the control of speed, stopping, starting and reversing in a direct-connected diesel can not be accomplished with anywhere near the economy of that of an electric motor. With the electric drive, the diesel may work under exactly the same ideal conditions as in an electrical power plant on shore, always turning in the same direction and running at the most efficient speed. The motor furnishes the power to the propeller by means of simple rotation with nearly constant tor-

que, thus minimizing the serious strains set up by reciprocating action due to the wide fluctuations in torque in the cycle of rotation. For convenience specific advantages of electric drive using two oil engines over that of a single oil engine directly connected are noted as follows:

1—Continuity of service securing the important factor of reliability.

2—Economy at widely varying speeds.

3—Elimination of reversing mechanism, reserve compressed air tanks, additional compressors and all maneuvering difficulties and uncertainties.

4—Less chance of repairs that can not be handled by the ship crew.

5—One of the two engines will provide enough power to run the ship at from $\frac{2}{3}$ to $\frac{3}{4}$ of the normal speed. Single screw with two engines.

6—The engines may be run at the higher revolutions which are best adapted for maximum efficiency.

7—Exact power measurements from readings of the ordinary electrical instruments mounted in the engine room, giving true record of performance as a check on and an aid to improving economies. Continuous records may easily be secured by means of recording instruments, all this without in any way interfering with the ship's regular schedule.

8—The reversing torque delivered to the propeller may be made anything from zero to the full power delivered by the engines without affecting the efficiency of the engines in the forward direction.

As no steam is necessary in this vessel for the main drive, all auxiliaries both on deck and in engine room will be electrically driven. In the deck machinery, winches, windlass and capstans, the service is most severe from an electrical point of view. Recent continued development of electric auxiliaries has definitely overcome early difficulties due to moisture and exposure to salt air and the elements. Against the increased cost of electric drive for auxiliaries is the lesser cost of installation and the use of cables for the transmission of power in place of steam pipes. Many important advantages are gained by complete electrification of the ship's auxiliaries, some of which may be noted as follows:

1—On account of few moving parts this type can be made rugged, simple, and easy to operate, eliminating troubles due to carelessness and affording quick handling of cargo.

2—If properly designed and built will run indefinitely with ordinary care requiring only cleaning and lubrication of bearings. Maintenance costs will consequently be low offsetting the comparatively small difference in initial cost over steam auxiliaries.

3—Stand-by losses are reduced to a

minimum. Transmission losses are small during operation and entirely eliminated during idle periods. A decided over all fuel economy in operation.

4—An important consideration is the freedom from danger of freezing up of deck machinery in cold weather.

Though difficult to translate into exact dollars and cents value the tremendous importance of simplicity and order in all the mechanical appliances on board ship should be recognized as it has been in the development of power plants on shore. Complete electrification using carefully designed and properly constructed units will effectively promote the achievement of this condition. Leaks, heat and noise will be eliminated and the resulting neatness, cleanliness and simplicity will tend to maintain the welfare of the physical man and react favorably on the mental, thus improving the morale and tone of the crew, on which foundation, rests the ideal of all seafaring men and operators, the happy ship.

Initial cost using diesel electric drive will be greater. This consideration is not, however, of primary importance, when due consideration is given to all the advantages accruing. Established steamship companies looking forward to operation over a long period of time need to avail themselves of the latest improvements and developments in their field with the same initiative and progressiveness characteristic of other industries. Standing prestige and efficiency will be enhanced by the adoption of good new features which are economical-sound.

San Francisco Bay Yards Have Rush of Work

Practically all the ocean trades in and out of San Francisco bay ports showed increased activity in March and April, even surpassing the already good record set in the first two months of the year. One of the results of this was a steady growth in the work offered to all of the shipyards on the bay, both in repair and reconditioning work. An unusually heavy movement in the coastwise lumber trade, continued gain in inter-coastal business, and an impressive increase in transpacific traffic, have united to call forth tonnage which has been tied up, and, in some cases, new tonnage bought in the east and brought to the Pacific coast through the canal.

The Bethlehem Shipbuilding Corp. turned over to the Standard Oil Co. of California, in April, the first diesel-engined, electric-driven tanker ever constructed. It was named the *STANDARD SERVICE*, and all the auxiliaries, as well as the propeller, are motor-driven. The tanker is equipped with two 360-horse-

power Werkspoor diesel engines, driving electric generators which supply current for a 600-horsepower reversible motor, direct-connected to the propeller shaft. Electric pumps empty the cargo tanks, which can be cleared in five hours; anchor winches, windlasses, steering gear, radiators, hot-water heaters, galley equipment, and lights are all electric. A feature of the vessel is the pocket on each side of the bow into which the anchors when hoisted disappear into the skin of the ship. These were constructed to obviate damage to either vessel by the rubbing of the suspended anchors, when the tanker lies alongside another ship to deliver fuel oil.

The Bethlehem Shipbuilding Corp. also obtained the contract, in April, from the Standard Oil Co. of California, for constructing an oil barge, to cost \$242,000 and require four and one-half months in building. The barge is to be of 12,000 barrels capacity, 200 feet long, 36 feet beam, and 16.05 feet deep.

The Union Oil Co.'s tanker *UTACAR-BOX* is undergoing repairs at the Bethlehem yards, including sandblasting of the entire hull, and alterations in the oil-piping system. The Matson Navigation Co.'s steamer *LURLINE* is at the Bethlehem yards, having her crankshaft out for examination, and also for cleaning, painting and other general overhauling of the ship. The ferryboat *SAUSALITO* was repaired at the same yards, and a new paddlewheel installed. The Compagnie du Boleo's steamer *PROVIDENCIA*, was retubed, and her anchor windlass rebuilt at the same yards late in March, where the Associated Oil Co.'s tug *ARAB*, seriously damaged by fire at Martinez recently, is undergoing repairs at a cost of \$21,875, exclusive of about \$920 for engine repairs.

The Moore Drydock & Shipbuilding Co., in Oakland, was low bidder for reconditioning the steamer *LAKE PEPIN*, bought from the shipping board by the Hammond Lumber Co. not long ago. Tenders for this job ranged from the Moore bid of \$65,000 to \$90,000. The work of fitting out the Alaskan fishing fleet also has kept the Moore yards occupied for the past two months, where voyage repairs were made early in April to the Pacific Mail liner *PRESIDENT LINCOLN*.

The A. W. DeYoung Ship Repair Co. was low bidder for reconditioning the former army transport *BUFORD*, recently purchased by Fred Linderman and J. C. Ogden, for service in the Puget sound-Alaska run. The DeYoung bid was \$49,981, the job to be completed in 45 working days. Other bids ranged as high as \$90,970 and 85 days.

The Hart-Wood Lumber Co.'s steamer *SOLANO* is on the ways at the Hanlon Shipbuilding Co. for general repairs cleaning and painting.

Launch Two Passenger Day Ships

Delaware River Yard Is Completing Specially Designed Steamers for Philadelphia-Wilmington Service

THE Wilmington Steamboat Co., Wilson line, has for a long time conducted a popular day passenger and summer excursion service from Philadelphia to Chester, Wilmington and beaches and parks situated on the Delaware river and at the head of Delaware bay. During the summer of 1922 in order to meet the growing demands of its business, plans and specifications prepared for the company by the George G. Sharp Co., naval architect and marine engineer, 30 Church street, New York, covering a greatly improved and enlarged day passenger steamer, were submitted for bids. A contract was placed with the old established shipyard of Pusey & Jones, Wilmington, for two, day passenger vessels according to these plans and specifications, to be built under the supervision of the designer. With the completion of the two steamers in time for the opening of the season of 1923, the Wilson line will have a fleet of seven large steel boats in the Philadelphia, Chester, Penns Grove, Wilmington and Riverview Beach service

having a total carrying capacity of approximately 14,000 passengers. The accompanying illustrations show the completed vessel and her launching.

On Tuesday, April 3, the first of these two vessels was successfully launched after having been christened the STATE OF DELAWARE by Mrs. Joseph Wilson. In the smaller view, the state of completion when launched is shown. The sister ship, to be named the STATE OF PENNSYLVANIA, was launched about the middle of April. The vessels are intended for river service during the summer months only, that is, from May 30 until Sept. 1.

Hull Characteristics

The vessels are steel, single screw, with these characteristics:

Length between perpendiculars,	
feet, inches	219-0
Beam molded, feet, inches	48-9
Beam over guards, feet, inches ..	58-9
Depth molded, feet, inches	13-9
Draft loaded—fresh water, feet,	
inches	8-9

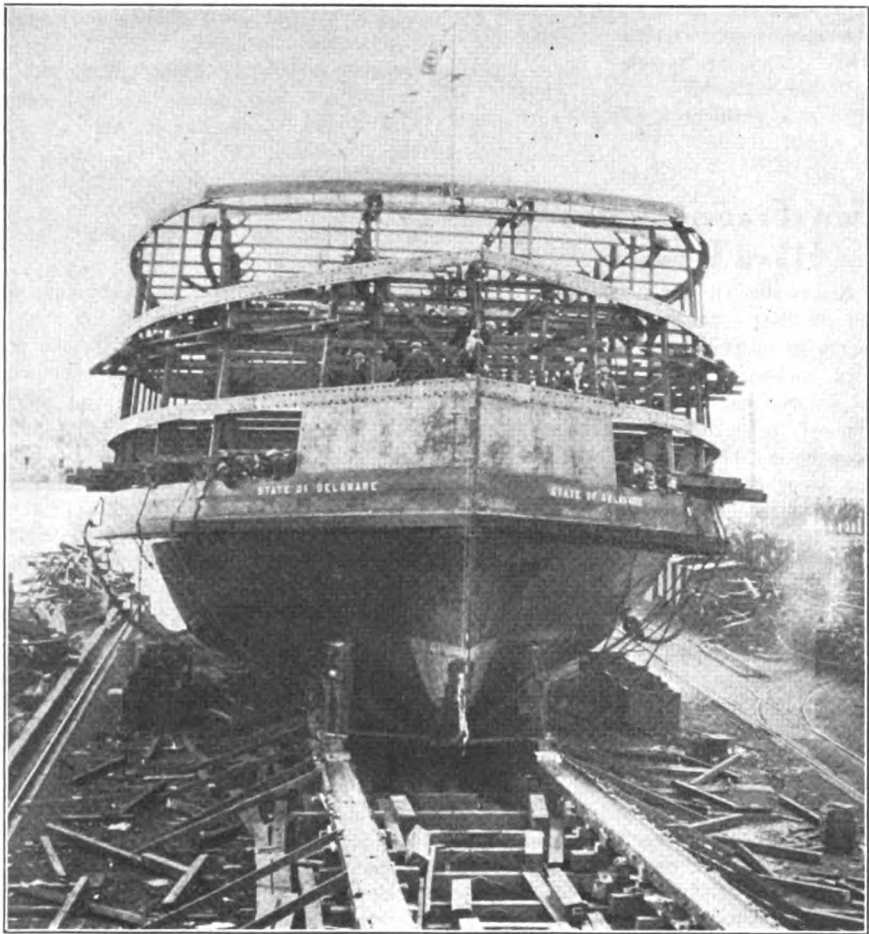
Speed—statute miles per hour	18
Passenger capacity	3000
Number of decks	4

Carefully worked out arrangements embodying certain unique features will provide comfort, refreshment and amusement during the trip for the entire complement of passengers. All four decks will be devoted to the use of passengers and ample space for seating all is provided. The first or main deck will have a certain amount of its space built in as rest rooms, smoking rooms and retiring rooms, while the remainder or open part of this deck will be devoted exclusively to the use of passengers. A well equipped refreshment booth also is on this deck.

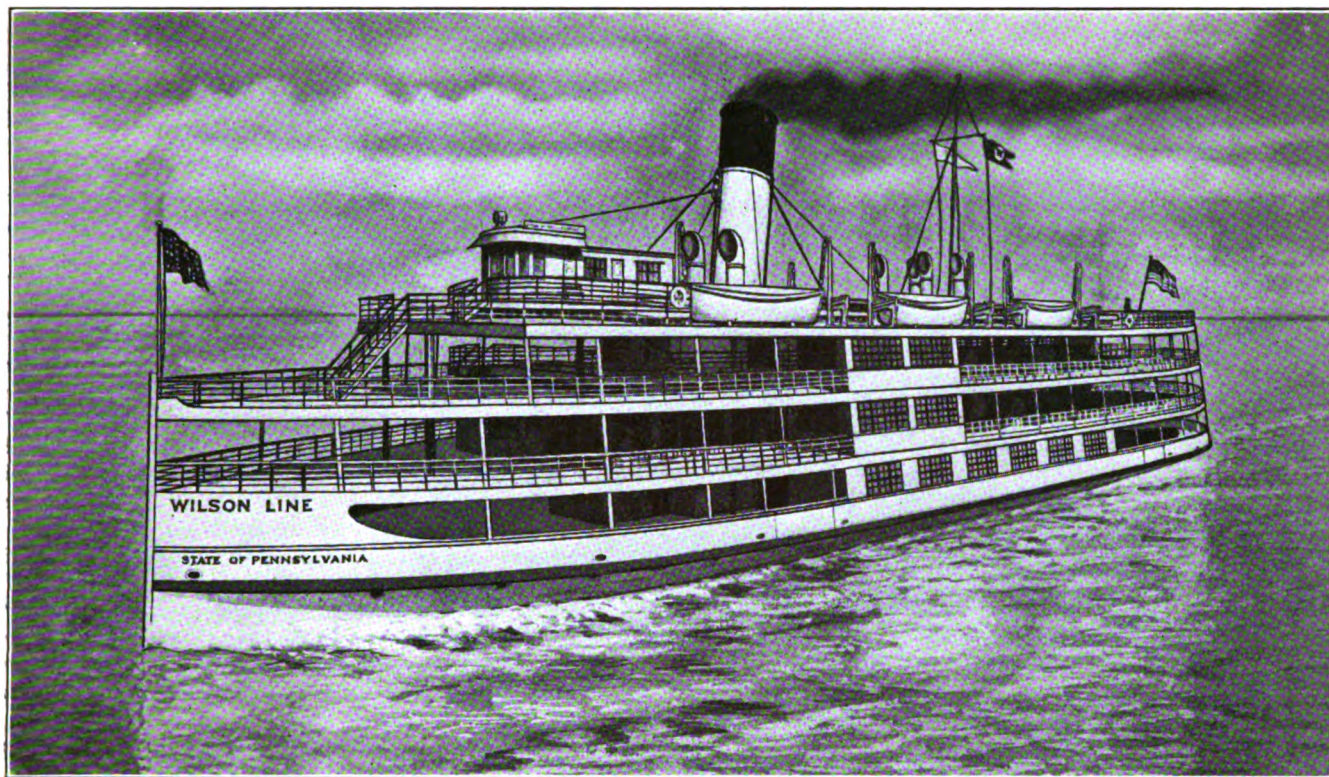
On the second or saloon deck, an exceptionally spacious dance hall is provided, 84 feet long and 34 feet wide, a clear unobstructed space with an orchestra stand centrally located. From 500 to 600 persons may be accommodated at one time. The appointments and decorations of this deck are carried out in a practical and artistic manner. Above the dance hall the ceiling is raised in two steps, the center portion being 12 feet high and on either side 10 feet high. Refreshment booths on both main and saloon decks are exceptionally well appointed. The counter space totals 160 feet in length and its construction embodies the latest principles for convenience and sanitary conditions. In conjunction with the counter, two soda fountains and attractive display cases are installed, comparing favorably with the latest developments in this line ashore. Fittings throughout of the counter, cases and shelves are either, monel metal or German silver. The saloon deck is also provided with a booth for dispensing refreshments.

Above the saloon deck comes the third or observation deck. The steps referred to in the ceiling over the dance hall form terraces in the observation deck, thus giving all passengers an unobstructed view. Each elevation will be furnished with comfortable chairs. The fourth or boat deck will also be open for passengers. This deck carries the captain's quarters and the pilot house. Lifeboats and other life saving equipment are placed on this deck, clear of passenger spaces.

Except for enclosures at the forward ends of the passenger decks, forming wind screens the space at sides between decks is open and fitted with rails. In rain or stormy weather protection is provided by fitting canvas drop curtains all around the vessel. Engineers, officers,



LAUNCH OF DELAWARE RIVER DAY STEAMER



FAST AND COMFORTABLE RIVER STEAMER BEING COMPLETED FOR PHILADELPHIA-WILMINGTON SERVICE

deck crew and attendants are all berthed below the main deck. The galley and mess rooms are also found below this deck.

Main Propelling Machinery and Auxiliaries

One 4-cylinder, triple expansion reciprocating engine, 2700 indicated horsepower at 155 r.p.m.

Two Babcock & Wilcox watertube boilers fitted for burning fuel oil.

Propeller, bronze built-up type.

The usual steam auxiliaries are fitted.

Two 15-kilowatt generators provide lighting for the vessel as well as power for the deck machinery.

The windlass is electrically driven.

An electrically operated capstan is placed aft.

A steam steering gear is located in the engine room connected to quadrant aft by means of wire rope and chain leads. The gear is operated from the pilot house by direct transmission of rods and gears.

As an auxiliary steering gear, a drum, tiller and tackle is fitted on boat deck aft.

Fuel oil is carried for the ship's use in four cylindrical tanks. Provision is also made for carrying coal in bunkers abreast the boilers. Fresh water for culinary and washing purposes is carried in large rectangular tanks. The forepeak is arranged for reserve feed water.

The vessels are classed in the American Bureau of Shipping, to the highest class for the service intended. Steel is used throughout for the main hull and

superstructure, except for the light canvas-covered wooden decks. Five steel watertight bulkheads subdivide the hull proper. Watertight doors are fitted for access between engine room, boiler room and line shafting space. The owners expect both vessels will be completed in time to commence their service on the Delaware river at the beginning of the season, on May 30. With the addition of these two fine steamers, a more frequent schedule can be maintained between Philadelphia, Wilmington, River Beach and intermediate points, and increased demands for service on Sundays, holidays and evenings, will be fully met for the time being.

Shipping Board Will Hold Up Ship Prices

Stories printed to the effect that government owned tonnage will be offered later at reduced prices have been recently denied by the shipping board. The effect of these unconfirmed rumors has been to cause prospective buyers to hesitate to conclude contracts at present rates. The statement follows: "There is no prospect of shipping board ships being sold at less than world market prices for unrestricted service under any plan that the board has had under consideration."

The PARTS, 32,000-ton liner of the Compagnie Generale Transatlantique, was equipped with a Sperry gyrocompass on a recent trip to New York.

Puget Sound Shipyards Are Busy

Seven hundred men have been employed at Todd Dry Docks, Inc., Seattle, during the last month, several large repair jobs having necessitated an increased force. At this plant, the shipping board tanker LUBRICO, returned to commission, underwent extensive repairs and overhaul at a cost of \$20,000. The LUBRICO was damaged by grounding more than a year ago and was laid up without repairs. The steamer COMMERCIAL TRAVELER is now being repaired at Todds following stranding in Puget sound waters. This contract involves an expenditure of more than \$100,000. Fifty hull plates were damaged and of these 25 were replaced. The steamer SAGAHADOC has also been at this plant undergoing extensive repairs after being ashore for four days. The yard's three drydocks have been in constant use with an unusual rush of spring overhaul work.

Other Puget sound yards are also enjoying a prosperous season of spring work, 1500 men being employed at repair plants compared with less than 600 at the same time last year. Increased work is attributed to improved conditions in lumbering, mining, fishing, packing and in general business.

After being thoroughly overhauled at the Todd plant, the express steamship H. F. ALEXANDER, formerly the GREAT NORTHERN, has returned to commission between Puget sound and California. This

vessel has had the Todd oil burning system installed. This, together with changes in propeller blades, has added a knot to the fast vessel's speed. The same yard has completed alterations to the government power vessel *BOXER* assigned to the Alaska bureau of education.

An 82-foot wooden halibut schooner, the first vessel of this type built on Puget sound in several years, is being constructed at the Salmon Bay yards, Seattle. At the same plant, six fishing schooners are having diesel engines installed, replacing gas engines.

The Lake Union Dry Dock & Machine Works has purchased a 2500-ton drydock from the Columbia River Shipbuilding Co., Portland, Oreg. The lift will be towed from the Columbia river to Seattle where it will immediately be placed in commission. The Seattle company, during April will launch from its yards a 76-foot seagoing tug, a 120-foot car barge and a 64-foot power pleasure cruiser. More than 100 men are employed at present.

Ten wooden scows, for lumber and

packing firms, are being constructed by the Marine Construction Co., Seattle. This firm has just completed a \$15,000 bucket dredge.

The automobile ferry, built for the Canadian Pacific for service between Bellingham, Wash., and Vancouver island, was launched from the ways at Yarrows' yard, Victoria, B. C., March 31. The vessel was christened *MOTOR PRINCESS*.

The Seattle Tug & Barge Co. has had plans prepared for 65-foot deep sea tug to be equipped with diesel engines. Construction is to be started soon. The vessel will be used for towing in Alaskan waters.

The St. Helens Shipbuilding Co. has been awarded the contract for constructing the hull of the dredge *MISSOURI* to be built for the Long-Bell Lumber Co., Longview, Wash. The hull will measure 105 feet by 39 feet beam. It will have a 15-inch suction dredge. Machinery is being shipped from the Atlantic as well as steel for the 20-inch dredge *ELLCOTT* which will be assembled by the

Portland plant of the Albina Machine Iron Works.

Negotiations for the purchase of the passenger steamer *ROSE CITY* by the Admiral line have not been concluded. Announcement from Portland is to the effect that if the deal is not concluded, the San Francisco & Portland Steamship Co., a subsidiary of the Union Pacific, will likely buy or build two fast passenger and freight steamers to operate in connection with the *ROSE CITY* between Portland and San Francisco.

April 17 is the date set for the launching of the steel steamer *ALASKA*, built for the Alaska Steamship Co. by the Todd Dry Dock & Construction Co., Tacoma. The *ALASKA* will be a twin screw vessel equipped with two engines of 2800 horsepower each. She is planned for the installation of diesel engines in future, if deemed expedient.

Part of the plant of the former Patterson & McDonald Shipbuilding Co., Seattle, was recently destroyed by fire. The site is now occupied by the Western Pipe & Steel Co.

Dieseled Tug Placed in Canal Service

OPERATION of the tug *TRANSCO II* in the barge canal service between New York and Buffalo is an innovation in that it is the first dieseled tug in the service and may be the means of the general adoption of oil engine power units in place of steam equipment. The tug, first of three built for the Transmarine Corp., is 67½ feet long and 17½ feet beam and was built in the Hildebrandt yard at Port Ewen, N. Y.

The *TRANSCO II* and the other tugs

are equipped with the diesel engines, built by the New London Ship & Engine Co. Groton, Conn. The engine is the pioneer American diesel, scores of which have been used, in United States navy submarines, motorships, tugs, trawlers and ferries of all descriptions on both the Atlantic and Pacific coast. Though many felt that the introduction of a dieseled towboat on the barge canal was an experiment, the type of engine installed has been employed with success in smaller

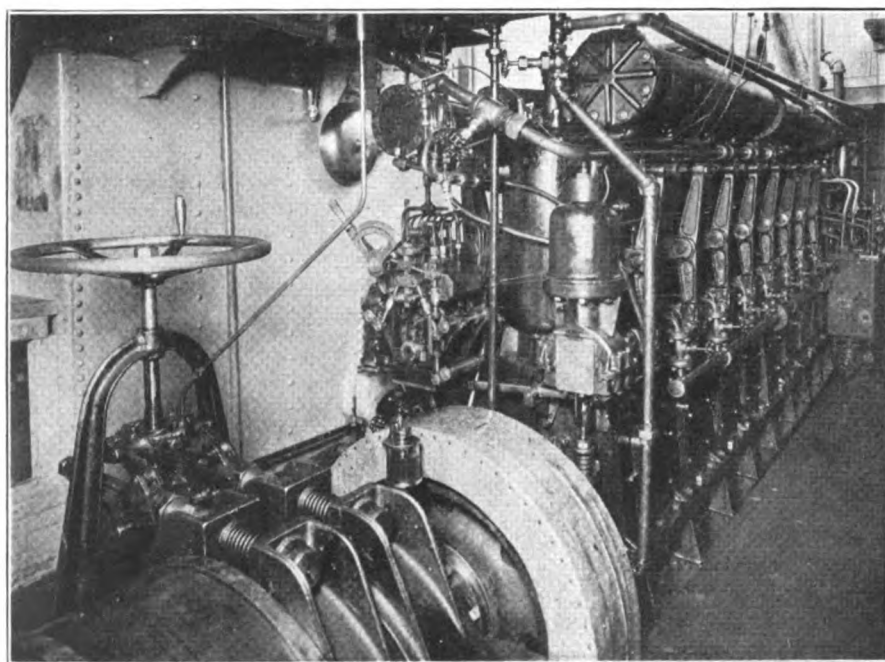
vessels on the Pacific coast for nearly a decade.

The engine is of the heavy duty, 4-cycle, reversing gear type, working on the diesel principle and using crude or fuel oil for fuel. Engine has eight working cylinders, 9-inch diameter and 12½-inch stroke, developing 240 horsepower at 350 revolutions per minute. At the forward end of the engine there are two compressors for supplying air for injecting the fuel, and for starting purposes, provision being made on four working cylinders for starting the engine by means of compressed air. The compressors are of the stage tandem type, and provision is made for regulating the pressure carried on the spray air by means of a throttle on the first stage suction.

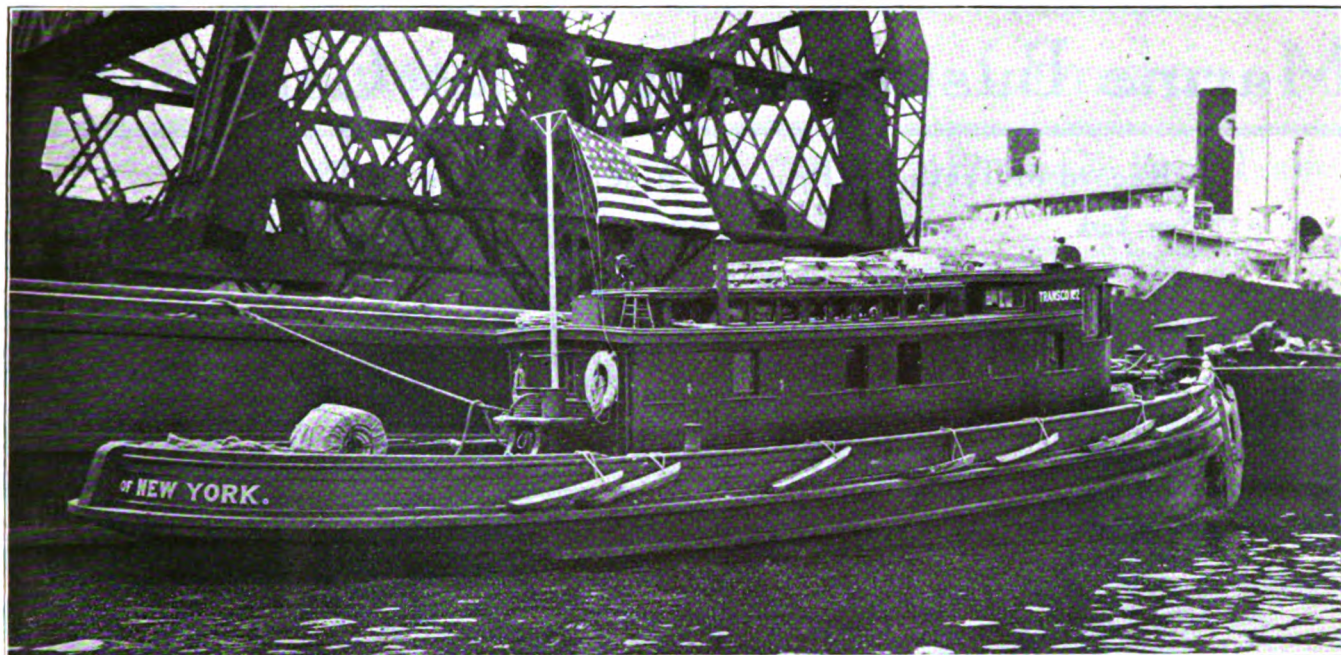
Some of the incidental features of the *TRANSCO II* and her sister towboats are:

Fuel consumption. The builder has estimated that this dieseled tug will operate on 15 per cent of the fuel expense of the steam tug. This statement is based upon actual operating cost of diesel tugs compared with steam craft of half the horsepower.

Greater power. The present canal tow boats vary from 75 to 100 developed horsepower. The guaranteed towing strength of this large engine is 240 brake horsepower, or approximately 250 per cent greater than the average canal tow boat according to the builders. The engine for the smaller boat is guaranteed at 180 brake horsepower. This addi-



240 BRAKE HORSEPOWER DIESEL ENGINE FOR BARGE CANAL TUG SERVICE



TUG, SPECIALLY DESIGNED FOR BARGE CANAL SERVICE. FOR WHICH MANY ECONOMIES ARE CLAIMED. SHE IS EQUIPPED WITH A DIESEL ENGINE

tional energy was designed to shorten the transit time from New York to Buffalo by 24 to 36 hours. The oil bunkers are so designed that one fueling will be sufficient for the round trip from Albany to Buffalo. This increase in speed is not obtained at a sacrifice of fuel. The economic speed in tugs of this type used for long towing on the Pacific coast is 10 miles per hour light and six miles per hour with tow.

Maneuvering qualities. The additional power offers another advantage. When maneuvering at terminals this excess energy is utilized effectively by aiding the control of the fleet units. Docking in tidewater is facilitated by the ability to fight tide rips and adverse winds.

Starting advantage. The engine is able to develop full power five minutes after starting, according to the builders. A steam engine requires at least five hours' fire before the boilers can furnish the maximum, it is said.

Fix Date for Sailing of Leviathan

The LEVIATHAN will sail from New York on July 4 on her first trip to Cherbourg and Southampton. She is now being reconditioned at Newport News, Va., and will go from there to the Boston navy yard to be drydocked and painted before being put in commission.

The Crowley yard, San Francisco, was low bidder for general repairs to the steamer APUS, and the work is now completed. The same yard also obtained the contract for repairs to the British steamer BERENGAR.

Builds Derrick Barge

A new derrick barge recently built for the Kelly Axe Mfg. Co., by the Charles Ward Engineering Co., Charleston, W. Va., is 42 feet in length, 30 feet in breadth and 5 feet in depth. Its equipment includes a steam locomotive crane with structural base. The capacity at 19 feet 6 inches radius is 22,250 pounds. The capacity at 57 feet radius is 5200 pounds. The maximum reach of the boom in the lowest position is 38 feet beyond the end of the hull. The barge was designed by Cox & Stevens, New York.

The hull is of steel construction

throughout, one end having a scow bow to facilitate towing from one location to another. The opposite end of the hull is square and at this end two anchorage spuds have been placed. The hull in the way of the foundation for the locomotive crane is made watertight to permit of fresh water being carried for the boiler of the hoist.

On deck, a portable coal box, having a capacity of three tons of coal, is provided. This coal box is placed on shore by the crane for filling and returned to the barge by the crane. The draft of the hull when fully loaded is 34 inches.

The Kelly Axe Mfg. Co. proposes to use this barge to excavate a lagoon at its Charleston works to form a harbor for its other floating equipment, and later for loading and unloading steel material at the Charleston plant, for handling hickory logs (for making handles) obtained on the Tennessee, Cumberland, and Green rivers, and also for unloading purposes at the various points on the rivers where its finished product is delivered.



DERRICK BARGE FOR RIVER USE

Messrs. Harland and Wolff, Belfast, have overhauled the Red Star liner BELGENLAND, having a tonnage of 27,000 tons. The vessel has left the port of Belfast to commence sailing on the north Atlantic route. The ship was built during the war and was temporarily fitted as a cargo vessel, but she has now been completed as a first-class passenger ship capable of carrying 500 first-class and 1000 each, second-class and third-class passengers. The vessel is 697 feet long, 78 feet beam and 49 feet deep, and will run to New York.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	477	1,764,113	494	1,857,212
February	395	1,437,919	413	1,529,096
January	423	1,679,843	439	1,690,010
December, 1922..	397	1,569,778	473	1,819,341
November	426	1,626,068	463	1,805,798
October	452	1,846,327	467	1,848,637
September	519	1,985,981	542	2,104,884
August	515	1,772,837	508	1,865,798
July	509	1,928,541	520	1,977,690
June	486	1,718,879	551	2,070,048
May	524	1,769,601	496	1,759,780
April	454	1,651,584	473	1,758,160
March	462	1,708,727	484	1,829,016

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	111	306,580	76	209,261
February	67	160,678	54	139,701
January	98	287,240	64	182,402
December, 1922..	78	209,962	63	167,736
November	75	221,130	78	241,326
October	80	205,137	73	202,326
September	103	261,963	74	224,079
August	104	273,123	76	222,478
July	116	307,058	84	248,337
June	103	282,251	83	233,964
May	117	310,117	80	234,220
April	94	245,785	63	197,807
March	107	288,295	79	257,149

Norfolk and Newport News

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	16	51,333	71	200,858
February	8	24,958	42	130,121
January	14	41,127	44	121,152
December, 1922..	19	52,716	40	137,081
November	6	21,036	38	118,738
October	17	44,423	46	149,670
September	5	22,051	45	132,751
August	15	43,887	51	158,879
July	22	62,986	55	158,254
June	22	73,791	56	175,961
May	21	61,513	73	198,599
April	18	59,180	83	232,485
March	29	77,775	79	235,809

San Francisco

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	50	168,399	71	237,195
February	47	165,333	60	214,686
January	51	156,249	65	216,083
December, 1922..	54	187,648	68	234,385
November	42	154,024	42	154,280
October	59	159,855	69	261,687
September	52	163,697	65	233,079
August	65	221,288	68	219,326
July	64	194,586	55	191,574
June	51	182,219	47	161,761
May	50	170,506	56	191,858
April	50	174,713	54	190,928
March	52	185,391	58	188,930

Baltimore

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	123	375,762	117	354,803
February	80	240,133	94	275,291
January	115	322,661	110	306,393
December, 1922..	110	322,948	104	380,616
November	114	361,162	132	403,593
October	97	289,239	101	304,431
September	107	333,387	112	298,444
August	110	326,163	106	300,080
July	103	320,104	90	280,394
June	99	280,002	118	333,877
May	117	350,494	103	282,285
April	98	277,582	110	319,103
March	107	323,515	125	362,451

Seattle

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	28	129,070	30	138,428
February	26	120,548	39	156,258
January	27	125,551	36	155,129
(Inclusive of Domestic)				
December, 1922..	201	560,159	198	564,367
November	138	374,871	139	374,871
October	164	417,901	148	406,498
September	159	375,340	159	382,079
August	162	396,363	153	387,908
July	140	373,211	137	371,526
June	139	384,290	137	354,702
May	138	357,583	150	361,835
April	129	328,172	154	365,057
March	198	508,760	202	515,606

New Orleans

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	253	648,990	269	682,080
February	204	559,638	206	539,965
January	242	713,589	233	695,524
December, 1922..	211	543,884	222	573,111
November	220	598,306	219	599,150
October	239	630,306	235	625,605
September	212	555,017	223	571,299
August	249	625,819	250	629,150
July	227	570,709	236	601,740
June	253	596,752	234	587,483
May	236	632,495	230	610,916
April	221	565,559	225	594,842
March	235	643,251	258	716,568

Boston

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	106	330,766	51	139,776
February	102	323,880	48	128,949
January	148	429,849	61	160,090
December, 1922..	138	383,366	61	181,975
November	130	357,264	59	123,255
October	149	408,855	91	217,899
September	193	511,027	101	248,328
August	192	449,871	116	203,774
July	159	324,795	94	229,492
June	137	169,015	94	161,888
May	133	251,304	104	192,231
April	71	138,683	103	270,499
March	85	241,289	56	135,671

Mobile

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	88	203,032	88	206,285
February	83	186,479	72	160,777
January	77	145,151	67	153,001
December, 1922..	66	123,746	56	119,821
November	68	147,775	53	130,769
October	59	143,207	52	110,398
September	66	121,037	51	85,801
August	60	112,431	65	137,552
July	79	152,475	73	138,543
June	77	153,357	76	141,413
May	61	109,793	55	114,691
April	61	144,237	62	123,238
March	73	136,937	57	110,363

Los Angeles

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	115	251,459	90	185,155
February	86	148,957	83	137,564
January	91	153,564	92	141,332
December, 1922..	133	132,114	76	83,537
November	110	111,803	111	112,934
October	117	115,548	138	94,522
September	61	127,969	96	133,561
August	52	143,931	43	117,758
July	44	125,139	48	138,275
June	48	109,261	38	90,915
May	47	141,219	55	174,644
April	53	161,709	45	138,927
March	75	172,471	59	139,424

Key West

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	91	88,639	90	83,220
February	69	68,735	64	68,658
January	89	81,622	86	79,210
December, 1922..	74	77,623	78	85,839
November	69	71,740	70	71,705
October	61	67,755	64	77,225
September	57	64,645	59	62,676
August	65	69,962	61	65,883
July	67	80,673	67	85,336
June	60	73,308	58	73,842
May	89	107,629	82	101,318
April	77	81,917	81	86,471
March	97	78,984	92	76,531

Portland, Me.

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	29	94,128	31	83,391
February	33	91,190	36	100,312
January	49	144,429	42	126,949
December, 1922..	48	144,019	48	136,247
November	22	45,567	21	46,755
October	27	60,114	22	49,594
September	32	68,125	27	57,609
August	28	42,746	28	47,459
July	19	39,950	20	39,571
June	11	16,601	15	21,765
May	16	21,380	10	22,477
April	14	51,228	18	62,091
March	23	81,938	20	77,044

Savannah

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	31	95,905	30	89,323
February	31	87,315	31	87,703
January	28	93,564	28	93,587
December, 1922..	22	66,619	17	57,279
November	14	41,665	15	40,606
October	19	52,065	19	46,054
September	26	68,878	26	73,540
August	22	63,662	22	59,974
July	23	66,833	23	61,655
June	11	24,870	20	53,367
May	11	20,536	16	40,181
April	8	20,485	15	42,591
March	6	12,845	19	47,946

Galveston

(Exclusive of Domestic)

Month	Entrances		Clearances	
	No. ships	Net tonnage	No. ships	Net tonnage
March, 1923....	58	170,841	97	287,278
February	48	146,944	76	233,591
January	69	219,967	89	282,889
December, 1922..	64	214,952	79	260,159
November	56	174,964	87	304,352
October	59	156,587	85	260,702
September	48	144,403	56	187,724
August	59	180,814	63	203,194
July	52	165,276	57	186,201
June	61	193,016	61	200,957
May	60	196,575	57	210,853
April	64	190,673	61	210,853
March	66	155,728	56	166,298

Marine Business Statistics Condensed

Port Traffic Record

Houston (Exclusive of Domestic)					
Month	Entrances—		Clearances—		
	No. ships	Net tonnage	No. ships	Net tonnage	
March, 1923.....	54	69,428	51	135,906	
February.....	49	50,379	48	167,872	
January.....	49	36,744	52	146,532	
December, 1922...	58	70,948	53	195,322	
November.....	65	72,192	63	215,043	
October.....	55	57,106	53	168,254	
September.....	43	46,600	43	97,005	
August.....	35	40,503	32	63,281	
July.....	29	30,909	32	73,299	
June.....	38	48,938	36	74,798	
May.....	44	45,108	42	134,046	
April.....	42	61,751	47	98,825	
March.....	48	45,312	40	105,309	

Port Arthur, Tex. (Exclusive of Domestic)					
Month	Entrances—		Clearances—		
	No. ships	Net tonnage	No. ships	Net tonnage	
March, 1923...	64	188,176	55	169,005	
February.....	52	172,273	44	142,554	
December, 1922	59	210,778	65	218,274	
November.....	42	143,551	47	154,010	
October.....	68	227,039	66	217,502	
September.....	53	158,181	57	168,681	
August.....	69	227,941	70	224,654	
July.....	88	296,956	82	270,263	
June.....	81	271,752	87	285,633	
May.....	90	303,623	88	292,595	
April.....	90	282,288	101	313,829	
March.....	91	318,679	87	269,369	

Providence (Exclusive of Domestic)					
Month	Entrances—		Clearances—		
	No. ships	Net tonnage	No. ships	Net tonnage	
March, 1923...	8	31,910	8	34,367	
February.....	17	56,353	10	39,840	
January.....	13	45,175	12	52,651	
December, 1922	6	23,609	8	29,871	
November.....	11	47,565	10	31,470	
October.....	9	31,293	9	31,232	
September.....	30	84,037	13	40,223	
August.....	18	61,741	11	38,649	
July.....	10	19,279	7	22,228	
June.....	10	31,095	7	17,423	
May.....	14	49,985	13	37,000	
April.....	9	24,854	7	31,049	
March.....	12	45,966	8	34,272	

American-Hawaiian Again To Operate Independently

The United American lines has given up the management of the American-Hawaiian Steamship Co. According to an official statement issued after a meeting of the directors of the American-Hawaiian line, this company will move its headquarters from New York to the Pacific coast. This change caused considerable interest among steamship men and was laid to the advantages of having the main offices at the point where the larger part of the line's business originates.

Complete reorganization in the traffic and operating departments will be undertaken. It is understood that no financial adjustments are involved and R. H. M. Robinson, the president of the United American lines stated that the change was simply a matter of business expediency. The United American lines, having no offices on the Pacific coast, will relinquish all

management of the American-Hawaiian Steamship Co., and will devote its entire attention to the development of the shipping subsidiaries of the American Ship & Commerce Co.

The following officers were elected to serve for the American-Hawaiian Steamship Co.: W. A. Harriman, re-elected chairman of the board; Cray W. Cook, San Francisco, president, and J. D. Tomlinson and Henry Dearborn, vice presidents. The board of directors is W. D. Clark, C. W. Cook, H. Dearborn, W. A. Harriman, J. H. Post, R. H. M. Robinson, C. B. Seger, J. D. Tomlinson and R. D. Lapham.

The United American line owned by the American-Hawaiian and the American Ship & Commerce Corp. has operated both companies for the past three years.

Pittsburgh River Traffic

March, 1923				
Commodity	Allegheny river short tons	Monongahela river short tons	Ohio river short tons	
Coal.....	73,040	1,590,502	251,603	
Coke.....	32,902	
Gasoline.....	800	450	200	
Gravel.....	73,890	47,420	21,975	
Packet cargo.....	4,296	
Sand.....	66,672	59,419	26,936	
Steel products.....	17,291	16,191	
Unclassified.....	500	4,230	2,067	
Total.....	214,902	1,753,214	323,267	

February, 1923				
Commodity	Allegheny river, short tons	Monongahela river, short tons	Ohio river, short tons	
Coal.....	30,800	1,625,310	167,400	
Coke.....	0	27,365	0	
Gasoline.....	1,000	630	270	
Gravel.....	6,500	34,500	12,770	
Packet cargo.....	0	0	2,208	
Sand.....	14,100	32,671	11,840	
Steel products.....	0	19,337	3,285	
Unclassified.....	0	6,874	4,057	
Total.....	52,400	1,746,687	201,830	

Record of Traffic Through Panama Canal

		Atlantic to Pacific traffic —Panama Canal—			Pacific to Atlantic traffic —Panama Canal—			Total traffic through canal —Panama Canal—		
		No. of ships	Net tonnage	Tons of cargo	No. of ships	Net tonnage	Tons of cargo	No. of ships	Net tonnage	Tons of cargo
1923										
February	American	97	486,186	325,835	82	422,871	633,458	179	908,673	959,293
	Foreign	78	354,190	237,604	91	366,614	530,944	147	620,874	603,985
	Total	175	840,376	563,439	151	689,171	999,839	326	1,529,547	1,563,276
January	American	88	450,254	313,094	67	320,300	462,245	155	770,554	775,339
	Foreign	106	473,524	285,649	91	366,614	530,944	197	840,138	816,593
	Total	194	923,778	598,743	158	686,914	993,189	352	1,610,692	1,591,932
1922										
December	American	78	363,857	328,924	68	344,847	551,907	146	710,704	880,831
	Foreign	83	352,020	231,494	75	312,539	422,777	158	664,559	654,271
	Total	161	717,877	560,418	143	657,386	974,684	304	1,375,263	1,535,102
November	American	65	324,783	234,500	55	273,293	416,515	120	598,076	651,015
	Foreign	83	370,180	266,878	91	369,024	508,967	174	739,204	775,845
	Total	148	694,963	501,378	146	642,317	925,482	294	1,337,280	1,426,860
October	American	70	328,229	264,171	51	250,606	385,196	121	578,835	649,367
	Foreign	89	384,223	300,904	84	347,334	495,592	173	731,557	796,496
	Total	159	712,452	565,075	135	597,940	880,788	294	1,310,392	1,445,863
September	American	54	260,249	226,741	53	235,008	315,898	107	495,257	542,639
	Foreign	72	322,167	241,095	61	252,986	354,454	133	575,153	595,549
	Total	126	582,416	467,836	114	487,994	670,352	240	1,070,410	1,138,188
August	American	58	261,613	257,674	48	236,669	305,838	106	498,282	563,512
	Foreign	83	350,249	299,087	68	235,602	303,351	151	585,851	602,438
	Total	141	611,862	556,761	116	472,271	609,189	257	1,084,133	1,165,950
July	American	52	250,378	246,471	55	272,868	335,154	107	523,246	581,625
	Foreign	76	323,853	295,941	68	280,772	333,534	144	604,625	629,475
	Total	128	574,231	542,412	123	553,640	668,688	251	1,127,871	1,211,100
June	American	57	256,060	269,098	45	205,063	211,373	102	461,123	480,466
	Foreign	78	338,136	317,284	48	171,454	179,728	126	509,590	497,012
	Total	135	594,196	586,377	93	376,517	391,101	228	970,713	977,478
May	American	59	285,265	343,913	49	226,356	264,626	108	511,621	608,539
	Foreign	75	309,448	329,485	60	211,747	220,483	135	521,195	549,968
	Total	134	594,713	673,398	109	438,103	485,109	243	1,032,816	1,158,567
April	American	47	220,055	260,442	48	223,913	238,420	95	443,968	498,462
	Foreign	74	300,633	301,991	61	230,232	245,194	135	530,865	547,585
	Total	121	520,688	562,433	109	454,145	483,614	230	974,833	1,046,047
March	American	57	256,613	239,696	46	215,547	219,569	103	472,160	459,265
	Foreign	81	329,428	342,256	50	174,223	158,568	131	503,651	500,824
	Total	138	586,041	581,952	96	389,770	378,137	234	975,811	960,089
February	American	46	199,564	186,486	42	192,931	193,643	88	392,495	380,129
	Foreign	68	288,441	256,339	56	205,599	201,606	124	494,040	457,945
	Total	114	488,005	442,825	98	398,530	395,249	212	886,535	838,074

		Vessels in Ballast									
1923											
February	American	36	229,578	0	0	0	0	36	229,578	0	0
	Foreign	24	105,848	0	3	7,486	0	27	113,334	0	0
	Total	60	335,426	0	3	7,486	0	63	342,912	0	0
January	American	29	181,617	0	2	10,141	0	31	191,758	0	0
	Foreign	26	109,586	0	1	4,942	0	27	114,528	0	0
	Total	55	291,203	0	3	15,083	0	58	306,286	0	0

Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties—
A Record of Collisions, Wrecks, Fires and Losses

VESSEL	DATE	NATURE	PLACE	DAMAGE RESULTING	VESSEL	DATE	NATURE	PLACE	DAMAGE RESULTING
Ann Arbor No. 4	Mar. 12	Stranded	Frankfort Harbor	Sunk	Melissa Thurlow	Mar. 20	Ashore	Northport, Me.	Undamaged
Augusta G. Hilton	Mar. 6	Grounded	Vineyard Haven	Slight	Manchester Corp.	Mar. 7	Grounded	Halifax, N. S.	Slight
Amos Peggs	Mar. 20	Leak	Axim	Sunk	Manheim	Mar. 7	Dragged anchor	Rainsford Island	Grounded, undamaged
Breedijk	Mar. 8	Grounded	Foot Knoll	Not stated	Munargo	Mar. 10	Disabled	New York	Turbine trouble
Buckleigh	Mar. 16	Grounded	Jones Inlet	Jettis. cargo	Mabel Gale	Mar. 11	Sails lost	Norfolk	Deckload overboard
Bohemia	Mar. 22	Disabled	At sea	Abandoned	Minnesota	Mar. 12	Collision	Staten Island	Not stated
Birmingham City	Mar. 24	Collision	Off Sandy Hook	Dent in bow	Marborn	Mar. 12	In distress	At sea	Not stated
Barracoo	Apr. 6	Collision	Craighill Channel	Not stated	Miller County	Mar. 10	Collision	New Orleans	Not report'd
Centennial	Mar. 7	Storm	Bliss Island, N.B.	Wrecked	Mikula	Mar. 13	Ashore	Near Three Rivers	Hold flooded
City of Portland	Mar. 9	In tow	Near Norfolk	Disabled	Maid of Sparta	Mar. 19	On rocks	Off Ireland	Not stated
Chinampa	Mar. 10	Disabled	New York	Steerer trouble	Montauk	Mar. 17	Collision	New York	Side stove in
Clan Ross	Mar. 9	Lost anchors	New York	Not stated	Maurice R. Thurlow	Mar. 20	Ashore	Northport, Me.	Undamaged
Charles M. Everest	Mar. 10	Grounded	Peapatch Shoal	Not stated	Marjorie	Mar. 22	Stranded	Pimlico Sound	Not stated
Coldwater	Mar. 5	Grounded	Gaskins Banks	Undamaged	Monetnotpe	Mar. 26	Disabled	Key West	In tow
Canadian Seigneur	Mar. 12	Fire	Near Cristobal	To bunker coal	Mamie	Apr. 8	Stranded	Pimlico Sound	Not stated
Carrier	Mar. 10	Collision	New Orleans	Consider'ble	Nellie T. Walters	Mar. 6	Heavy weather	lat 42 08 lon 53	Lost sails
Charles F. Gordon	Mar. 22	Ashore	Cuban coast	Total loss	New York	Mar. 10	Disabled	City Island	Not stated
Cerro Ebano	Mar. 19	Disabled	Panama	Prop. shaft broke	Nelona	Mar. 10	Disabled	Barry	Not stated
Charlotte A. Maxwell	Mar. 20	Disabled	Wilmington	Leaking	Nordhvalen	Mar. 15	Fire	Baltimore	Slight
Cohasset	Mar. 26	Disabled	Gibraltar	In tow	Nordhvalen	Apr. 6	Collision	Craighill Channel	Sunk
Charlotte A. Maxwell	Mar. 29	Grounded	Off False Hook	Full of water	Ontario No. 1	Mar. 27	Fog, col.	Lake Ontario	Heavy
City of Victoria	Apr. 2	Fire	Mid-Atlantic	To cargo	Ontario No. 2	Mar. 27	Fog, col.	Lake Ontario	Heavy
Curaca	Apr. 9	Struck rock	Off Talcahuano	Hold flooded	Oswego	Mar. 29	Collision	Tampico	Not stated
Competitor	Apr. 7	Ashore	Near Nauset Sta.	Not stated	O. A. Knudsen	Mar. 29	Collision	Norfolk	2 plates damaged
Conisteo	Apr. 9	Grounded	Islboro	Not in danger	Oswald Boyd	Apr. 4	Grounded	San Pedro Island	Jettis. cargo
D. T. Helm	Mar. 14	Leak	Port Huron	Sank	Poljana	Mar. 9	On bar	Ship Island bar.	Not stated
DeWitt Brown	Mar. 10	Disabled	Key West	Leaking	Pollenzo	Mar. 22	Collision	Ship Island bar.	Not stated
Dorothy Palmer	Mar. 29	Ashore		Abandoned	Pennsylvania	Mar. 25	Grounded	Naples	Slight
E. M. Roberts	Mar. 8	Wrecked	Nantucket	Not stated	Pro Patria	Mar. 26	Disabled	Off Nicaraguan coast	Not stated
Eric Maru	Mar. 7	Ashore	Cuban coast	Undamaged	Panther Creek	Mar. 28	On rocks	Halifax	Prop. blades lost
Ethel	Mar. 22	Grounded	Reed Island Bar	Not stated	Richland Star	Mar. 30	Sank	Sandwich	Slight to hull
Evelyn	Mar. 29	Disabled	Barbados	Rudder and sails gone	Rosedon	Mar. 12	Collision	Tonawanda	Not stated
Editor	Apr. 1	Collision	At sea	Damaged	Ripogenus	Mar. 11	In ice	Staten Island	To railing
Elmer A. Keeler	Mar. 29	Sank	W. of New London	Not stated	Ripogenus	Mar. 20	Ashore	Off Lincolnville	Not stated
Elcicut	Mar. 26	Disabled	San Francisco	Not stated	Rita M. Cluett	Apr. 3	Disabled	Near Piebras Keys	Undamaged
Emergency Aid	Apr. 3	Disabled	Hamburg	Engines damaged	Rockhaven	Apr. 9	Grounded	Cardenas	Abandoned
East Side	Apr. 10	Grounded	Londonderry	Not stated	Scow No. 95	Mar. 9	Grounded	At sea	Not in danger
E. C. Lockhart	Mar. 26	Struck	Libby Island	Total loss	Scotia Maiden	Feb. 10	Fire	Sandy Hook Bay	Not stated
Fort Bragg	Mar. 8	Disabled	San Francisco	Steampipe broke	Sagadahoc	Mar. 10	Ashore	At sea	Lost
Frank M. Deering	Mar. 10	Ashore	Virginia coast	Not stated	Standard	Mar. 12	Disabled	Near Anacortes	Leaking
Flavel	Mar. 10	Disabled	Astoria, Ore.	Rudder broke	San Melito	Mar. 17	Disabled	California coast	In tow
Francis Reichert	Mar. 18	Collision		Sunk, raised	Sceptre	Mar. 17	Ashore	Tampico	Leak
Frank Richards	Mar. 20	Gale, broke moorings	Brooklyn	On rocks	Sunbeam	Mar. 23	Collision	Near Turks Island	Total loss
Franconia	Mar. 21	Ashore	Plymouth, Mass.	In tow	Scout	Mar. 27	Sank	Marcus Hook	Bow smashed
Frost	Mar. 31	Disabled	Charleston	Prop. broke	Surville	Apr. 1	Collision	Brooklyn	Not stated
Fredericia	Apr. 9	Collision	New York	Slight	Steel Traveler	Mar. 30	Disabled	At sea	Bows badly stove in
Giulia	Mar. 30	Foundered	At sea	Total loss	Southway	Apr. 5	Collision	Gibraltar	Rudder trouble
General Allenby	Mar. 15	Heavy sea	Halifax	Lost life-boats, sails	Sarah Johnson	Apr. 5	Collision	Off E. U. S. coast	Not stated
Gloria	Mar. 18	Leaking	Caibarien	Cargo damaged	Texan	Mar. 22	Grounded	Off E. U. S. coast	Sunk
Gulfmaid	Mar. 19	Collision	Schuylkill River	Slight to bow	Tolima	Mar. 9	In distress	Block Island	Leak and cargo dam.
Gowanus	Mar. 17	Collision	New York	Bows smashed	Trevithick	Mar. 22	Collision	At sea	Rudder broke
Glen White	Mar. 11	Grounded	Boston	Not stated	Tolosa	Mar. 24	Heavy seas	Bush Docks	Damaged
Giovanna Florio	Mar. 16	Gale, struck pier		Plates damaged	Thistlemore	Mar. 24	Collision	At sea	Boilers defective
Glendaruel	Mar. 24	Disabled	E. of Cape Cod	In tow	Troubador	Apr. 8	Fire	Near Barry	Slight
Gen. W. C. Gorgas	Mar. 21	Fouled buoy	Jacmel Harbor	To propeller	Vechedijk	Mar. 22	Collision	Montevideo	May be total loss
Glady's M. Hollett	Mar. 28	Disabled	Near Cape Race	Abandoned	W. R. Stafford	Mar. 12	In tow	Bush Docks	Damaged
Half Moon	Mar. 9	Grounded	Medan	Jettis. cargo	West Campgaw	Mar. 9	Disabled	Lake Erie	Not stated
Helvetia	Mar. 17	Rough seas	At sea	Lost deck-load, etc.	West Helix	Mar. 14	Disabled	Near Antwerp	Machy. disabled
Hermes	Mar. 21	Fire in bunk's	Edgewater	Slight	Wabash	Mar. 17	Disabled	At sea	Boil. trouble
Honrietta Simmons	Mar. 28	Gale	Off Provincetown	Lost anchor and chain	Winifred	Mar. 19	Disabled	Philadelphia	Mainmast gone
Hork	Apr. 2	Disabled	Horta	Rudder damaged	Winifred	Mar. 25	Grounded	Tampico	Two plates dented
Ibarta	Mar. 26	Fire	Norfolk	Not stated	West Elcasco	Mar. 4	Fire	At sea	Steerer dis.
Iverleith	Mar. 26	Disabled	New York	Oil tanks leak	Wallace Parsons	Mar. 28	Leaking	At sea	To cargo
John S. Thom	Mar. 9	In ice	Near Sorrel, Que.	Not stated	Zulia	Mar. 21	Disabled	Flushine	Undamaged
Jessie G. Noyes	Mar. 9	In tow	Near Norfolk	Disabled				Halifax	Rudder braces broke
J. E. Lawton	Mar. 19	Sank	Off Sparrows Pt.	Not stated					
John R. Gibson	Mar. 26	Disabled	Barbados	Eng. trouble					
John Dwight	Apr. 6	Disabled	Vineyard Sound	Sunk					
Knut Hamsun	Mar. 23	Collision	Marcus Hook	Not stated					
Lightship No. 90	Mar. 8	Gale	Fox's Point	Sunk					
Lankmoor	Mar. 13	On bar	Ship Island bar	Undamaged					
Lake Slavi	Mar. 9	Fire	Orange, Tex.	To No. 3 hatch					
La Purissima	Mar. 28	Explosion	San Pedro	Consider'ble					
Leerta	Mar. 28	Grounded	Corfu	Jettis. cargo					

Marine News in a Personal Way

Intimate Gossip About What Leaders in the
Maritime World Are Doing

G. H. FROEBEL, at present manager of the Houston, Tex., branch office, has been appointed manager of the marine sales department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. He succeeds D. D. Faris, deceased. He attended the University of Texas from 1907 to 1909 and then entered the employ of the San Antonio Gas & Electric Co. and the San Antonio Traction Co. Mr. Froebel entered the employ of the Westinghouse company in November, 1912, taking up the company's graduate apprentice shop course. He was transferred in 1914 to the Dallas, Tex., office as industrial salesman. Two years later he opened the Houston, Tex., branch office as manager of the industrial division for the entire district. He remained there until 1918, when he enlisted in the United States army. He re-entered the employ of the Westinghouse company in April, 1919, after being discharged from the army, and was placed in charge of the Houston branch office. He was made manager of that office in November, 1919.

* * *

D. J. HANLON, head of the Hanlon Drydock & Shipbuilding Co., Oakland, Cal., left for New York late in March to be absent more than a month.

* * *

ROBERT GAUNTLETT, Washington representative of the Newport News Shipbuilding & Drydock Co., paid a business visit to San Francisco in April.

* * *

CAPT. G. T. JANUARY succeeds CAPT. THOMAS BLAU, in command of the Pacific Mail liner ECUADOR. He has been serving as assistant to Andrew F. Martin, port captain for the Pacific Mail in San Francisco.

* * *

GEORGE H. H. REILLY, who has been connected with Simpson, Spence & Young for some time, has resigned to take charge of the chartering department of the General Steamship Corp. in San Francisco.

* * *

THOMAS G. PLANT has been appointed operating manager of the American-Hawaiian Steamship Co. Mr. Plant has been manager of McCormick, McPherson & Lapham, agents for various lines, with headquarters in San Francisco, for three years. The American-Hawai-

ian announces that it will open its own offices in San Francisco, probably in the Alaska-Commercial building, where the Williams-Dimond Co., which has been agent for the American-Hawaiian for some time, has its offices. This is the first time that the American-Hawaiian, which is the second oldest and largest steamship company under the American flag, has had general offices in San Fran-



G. H. FROEBEL

cisco. Mr. Plant left for New York late in March for conferences with Carey W. Cook, president, and other officials of the American-Hawaiian.

* * *

W. L. MCDUGAL, president of the Montreal board of harbor commissioners, made a tour of California ports in March, as a part of his general inspection tour of all the ports of the Pacific coast of Canada and the United States.

* * *

CAPT. OTTO SCHULTZ, formerly in command of the United States quarantine cutter ARGONAUT, has taken command of the bark STAR OF ENGLAND, for the Alaska Packers' association, and is now on his way to Alaskan waters with her.

* * *

CAPT. THOMAS BLAU, formerly in command of the Pacific Mail liner ECUADOR, has been appointed marine superintendent of the United States lines at

Bremen. The United States lines are the largest operators of shipping board vessels, with such ships as the LEVIATHAN and the GEORGE WASHINGTON in their fleet.

* * *

FRED M. LATHE, former port warden of Seattle, has been appointed United States shipping commissioner for the district of Washington succeeding James N. Neil, Tacoma. Mr. Lathe is a graduate of the sailing ship. His appointment was based on a creditable record made in a civil service examination.

* * *

WILLIAM H. TODD, prominent shipbuilder, made a hurried trip to the Northwest during March for the purpose of inspecting his plants at Tacoma and Seattle and to confer with local officials. With his guests, he came from Mobile, Ala., where he recently acquired a large repair plant.

* * *

CAPT. EDWARD MCCAULEY JR., who served with the United States navy for 30 years, has been retired, and has opened offices as a marine surveyor and consulting engineer, in San Francisco. Captain McCauley was in command of the GEORGE WASHINGTON when President Wilson made his two trips to Europe.

* * *

JAMES GLIDDON celebrated the beginning of his twenty-fifth year of service with the Toyo Kisen Kaisha, on March 18. He has been port steward in San Francisco for this company for more than 20 years. PERCY N. GLIDDON, his son, has just been appointed superintendent of the cold storage department of the National Ice & Cold Storage Co., and another son, GORDON GLIDDON, is sales manager for the Hanlon Drydock & Shipbuilding Co., Oakland, Cal.

* * *

JOHN B. MORRIS, veteran chief engineer of the Pacific Mail liner PRESIDENT WILSON, has resigned, as has also GEORGE E. CHANDLER, chief engineer on the Pacific Mail liner PRESIDENT PIERCE. Mr. Morris is slated to become chief engineer of the United States lines giant liner LEVIATHAN, and Mr. Chandler has been made chief engineer of the CHILORE, one of the two largest freight ships ever built on the Pacific coast. She is owned by the Ore Steamship Co.

Why British Ships Are Kept Busy

(Concluded from Page 169)

corporated in 1917 to carry out certain recommendations made by the board of trade "to meet the needs of British firms after the war as regards financial facilities for trade." It operates under a royal charter which has a life of 60 years and £2,000,000 of its £10,000,000 authorized capital has been subscribed. This bank has branches in Belgrade, Serbia, and the free city of Dantzic, together with affiliations with the South Russia Banking Agency, the National Bank of Turkey and the Trade Indemnity Co.

These two examples are sufficient to indicate the world-wide financial connections of the British banks with which the leading British shipowners and managers are so prominently identified. A British steamship organization is never at a loss for financial accommodation and facilities in any part of the world and usually the management of the steamship company is directly affiliated with a suitable banking organization through interlocking directors, as shown in Tables I and IV.

In Every Line of Trade

The intimate relations between the British merchant marine and the mercantile and trading organizations of the United Kingdom already have been discussed in some detail in connection with the outline of the activities of some of the men in Table I. The list of mercantile and trading organizations shown in Table VI, in all of which the men given in Table I hold directorships, includes 36 names, embracing organizations of every character. Oil, which is a prominent feature of the world's commerce at the present time, is represented along with meat, tea, rubber, coal, etc. If a complete list could be published it would show connections in practically every ramification of commerce including companies trading in all of the staple products of the world, such as copra, rice, grains, timber, minerals, cotton, flax, wool, etc. Interlocking directorships also are found in companies catering directly to the steamship business, such as the Suez Canal Co., Grand Junction Canal Co., Lloyd's Register of Shipping, Manchester Ship Canal Co., etc. Directors of British steamship companies are on every important canal board in the world except the Panama and Sault Ste. Marie, Mich. canals and the Kiel canal. British interests control the

Soo canal on the Canadian side and the exit from the Great Lakes to the sea. Their representatives also are on numerous port, river and harbor development organizations, maritime chambers of commerce, etc.

The manufacturing and producing companies listed in Table VII include 18 lines of industry represented by 44 corporations, and as in the case of trading concerns if a complete list could be presented, practically every form of manufacture and productive enterprise would be included. As it is, in Table VII are found the names of several of the largest of British manufacturing enterprises. Among these are Vickers Ltd., which is frequently referred to as the British Krupps; Harland & Wolff and John Brown & Co., shipbuilders whose names are known throughout the world; Dorman Long & Co., Guest Keen & Nettlefolds, and John Lysaght & Co., Ltd., three of the largest British steelmaking concerns, with an aggregate capacity of about 2,500,000 tons a year. The chemical industry is represented by Synthetic Ammonia & Nitrates, Liverpool Nitrates Co., and British Cellulose & Chemical Mfg. Co., the British government being a stockholder in the latter.

The engineering industries are represented by Beyer Peacock & Co., Metropolitan Railway Carriage, Wagon & Finance Co., Wolseley Motors Ltd., A. B. C. Coupler & Engineering Co., and others. Fundamental extractive enterprises in the coal, oil, iron ore and other fields, also are included in Table VII. In short, a complete list of companies in which British shipping leaders are interested would include an almost complete directory of British manufacturing, engineering, and productive enterprises.

What Shipping Success Requires

The reader who is interested may trace many other interesting connections with the aid of the accompanying tables. But it is hoped sufficient detail has now been presented to demonstrate the theme which it was intended to explain—a theme which perhaps may be re-expressed in the following form:

Shipping, the business of transportation by water, depends for its success upon the traffic furnished by the activities of other enterprises which include all forms of production and trade. Shipping is likewise dependent upon the financial facilities afforded by the international banks and on the operations of land transport agencies for collecting and distributing cargoes. It also is necessarily associated with pro-

ductive organizations such as insurance companies and with development associations such as chambers of commerce, harbor boards, etc. Affiliations with all these enterprises are necessary for the highest development of the shipping industry. The provision of the ships is only the first step in the development of a merchant marine.

Launch Big Lake Bulk Freighter at Toledo

The steamer **WORRELL CLARKSON**, launched recently by the Toledo Shipbuilding Co., Toledo, O., for the Kinsman Transit Co., Henry Steinbrenner, manager, Cleveland, is known as a 12,000-ton ship, being 600 feet over all, 60 feet beam, 32 feet depth, with 35 hatches, 9 feet wide and 12 feet centers. Hatch covers will be fitted with the Woods hatch rests. She is built with the transverse system throughout.

The latest improvements in shipbuilding have been installed in the **CLARKSON**. About 900,000 rivets will be used in building this ship. The riveting on the top sides is of 1¼-inch rivets, instead of 1½-inch rivets. Approximately 5000 tons of steel will be used, and the completed weight of the vessel will be about 6000 tons.

The cargo carrying space will be divided by three staggered stiffening type bulkheads into four compartments: No. 1 with eight hatches will carry 3100 tons; Nos. 2 and 3 with 10 hatches will carry 2850 tons each, and No. 4 with seven hatches will carry 3200 tons of ore on a 20-foot draft, a total of 12,000 tons. Her coal capacity will be about 14,000 tons. Her grain capacity will be approximately 450,000 bushels of wheat. The side tanks in her cargo hold run to the spar deck, thus obviating any cleaning off of shell plates in the quick dispatch of cargo. Her side tanks are separated from the water bottom so that each can be filled with water ballast and emptied separately. Her side tanks and water bottom can carry about 7000 tons of water ballast.

The coal bunkers are hoppers so that fuel will feed to the fireroom door. The steering gear is direct-connected shaft transmission while the rudder is the double pintle type with coupled stock.

The **CLARKSON**'s motive power will be furnished by a triple expansion engine 24½ x 41 x 65-inch cylinders and 42-inch stroke, and three Scotch boilers, 13 feet 6 inches by 11 feet, fitted with Learmouth purifiers, and Foster superheaters will furnish the steam. The outside stack will be 12 feet in diameter. The vessel will have a hot and cold pressure system of running water, furnishing water from two tanks of 9000 gallons capacity, carried forward in the dark hold. The steamer will be fitted with wireless equipment.

Late News From Atlantic Seaboard

THE Mallory Transport lines from Baltimore to the Mediterranean, announce a regular schedule of sailings to these points beginning in April. A monthly vessel will clear Baltimore for ports in Spain, Portugal and northern Africa, while practically every five weeks one will go to the Adriatic. Larger vessels will be used on the Genoa service, and the Marseilles call will be made fortnightly.

The first cargo of export sugar has been booked from the plant of the American Sugar Refining Co. at Baltimore, to Glasgow. This first movement will consist of 1000 tons on a vessel of the Baltimore Steamship Co. Regular tonnages of export sugar are expected to develop.

Baltimore's export coal trade has returned to normal, the tonnage since the first of the year having amounted to 75 per cent of the entire 1922 exports. So far 78,190 tons of cargo coal have been shipped out.

Announcement comes that the American-Hawaiian Steamship Co. will move its traffic offices to the Pacific coast and separate its Atlantic coast activities from those of the United American lines. These lines occupy joint offices at Baltimore.

Imports at Baltimore have been unusually active during the past month. Among the commodities inbound with the largest tonnages are petroleum, manganese and other ores, potash salts, wood pulp, copper, molasses, sugar and fruit. The lumber movement from the Pacific coast is increasing as is the canned goods business.

The Foreign Trade club of Baltimore held its largest meeting on the evening of March 13. It was Porto Rico night, in honor of the founding of the Porto Rican-American Steamship Co. Capt. William H. Stayton made the principal address, and responses were made by Horace N. Towner, governor-elect of Porto Rico, and F. C. Davila, resident commissioner for Porto Rico in the United States. Another meeting of the club was held on April 4, the principal speaker being Samuel J. Hoexter, director of foreign trade at the University of Detroit. His subject was "Education in Foreign Trade."

Exports of grain from Baltimore during March, 1923, amounted to 5,156,392 bushels of all grains. Corn maintained a slight lead over wheat, and rye shipments were in large volume. From Jan. 1 to March 31, grain exports from Baltimore reached 20,121,570 bushels, rye being in the lead. Flour exports for the same period amounted to 74,541 barrels.

Additional trade trips of Baltimore commercial interests are being planned for next fall. Trips will be made to the nearby industrial sections, to points in the Middle West not covered on the last

trip and to the upper Mississippi valley sections as far as Nebraska. Encouraging results have materialized from the January trade mission, each of the steamship companies reporting a volume of inquiries and much actual freight booked.

The largest cargo of coffee to reach Baltimore for many years arrived on March 31 on the steamer WEST KEENE of the International Freighting Corp. Baltimore representatives are the Export Transportation Co. The tonnage total, 43,000 bags, was all for local delivery.

Total arrivals at Baltimore during March, including both coastwise and foreign, reached 237, or an increase of 78 over February. American registry vessels totaled 149, followed by those of Great Britain, Norway, Denmark, Italy, France, Germany, Sweden, Danzig, Belgium, Holland, Spain and Finland.

The Merchants & Miners Transportation Co. made the first sailing of its new passenger vessel ALLEGHENY for Savannah and Jacksonville on April 6.

The arrival of the steamer EISENACH, of the North German Lloyd, marked the first liner of that company to arrive at Baltimore since 1914. A. Schumacher & Co. are local agents. The EISENACH brought a cargo of 2300 tons of crockery, toys, fertilizer salts, and other miscellaneous freight.

March customs receipts at Baltimore made a record for the port, the total being well over \$1,000,000. Both dutiable and free exports are more active at Baltimore at the present time than they have been for years.

A new steamship line to be known as the United Irish line, has been announced to operate from New York, Boston, and Baltimore, as soon as tonnage has been secured. It is said that an option has been taken on a 12,000-ton freight and passenger steamer to inaugurate the line.

Another company to enter the inter-coastal trade is the Planet Steamship Corp., said to be the result of the reorganization of the Green Star line. It will probably place the seven ships recently purchased by it in the coast to coast run. These ships will allow a weekly sailing in each direction, but they will all have to be extensively reconditioned.

Three of the large ore carriers of the Ore Steamship Corp. are in line to bring ore to the Bethlehem steel plant at Snarrows Point from the mines at Cruz Grande, Chile. The MARORE, the STEELORE and BETHORE, will bring 20,000 tons each.

With the acquisition recently of two 10,000-ton tankers from the shipping

board, the Pure Oil Co. will have a fleet of three large seagoing tankers, the first having been purchased several months ago. The vessels are named in honor of directors of the company as follows: W. E. HUTTON, W. F. BURDELL and W. W. MILLS. Rapid increase in the foreign and export business of the company and the construction of a 10,000-barrel daily capacity refinery at Smiths Bluff, Tex., required transportation facilities. The ships are expected to operate between Smiths Bluff, the Marcus Hook refinery and Hamburg.

A new 3-mast auxiliary schooner designed by Cox & Stevens, New York, for E. F. Hutton of the New York Yacht club has been safely launched at the yards of Burmeister & Wain, Copenhagen, Denmark. This vessel is reported to have a length over all of 196.7 feet and will be equipped with a 600-horsepower diesel engine capable of giving her a speed of 11½ knots and with fuel capacity for a cruising radius of 9000 miles. She is expected to be ready for delivery in June.

Junior naval reserve cadets will have an opportunity to gain practical sea experience during the summer months. The Admiral Oriental line and the Merchants & Miners Transportation line have agreed to carry reservists and to pay them regular wages while at sea.

The United States Navigation Co., agent for the Reardon Smith line, announced recently that the steamship PHOEBUS will be placed in berth service between New York, Philadelphia and Genoa-Leghorn, Italy. This vessel of 7500 tons deadweight was purchased for the Reardon Smith interests at the United States marshal sale recently at Baltimore, for the very low figure of \$70,500.

It is reported that the United States lines now operating their passenger ships from Hoboken, N. J., have taken a lease on pier 86, North river, New York, the intention being to sail the LEVIATHAN and other big vessels of the fleet later to be put into service, from this pier, in competition with the Cunard line. It is understood that the Hoboken pier will be retained for the vessels now using it.

A decision recently handed down by the Supreme Court of the United States has revoked the receivership for the Pusey & Jones Co. The Delaware receivers appointed by Judge Morris in the federal court in Delaware were former United States Senator Willard Saulsbury and Charles B. Evans, and were appointed on the application of Hans K. Hanssen, a Norwegian, who claimed to be a creditor and stockholder of the Pusey & Jones Co. Prior to the appointment of the Delaware receiver, Federal Judge John C. Knox, in New York City, had appointed Maj. Henry A. Wise,

receiver in bankruptcy for Christopher Hannevig. This appointment was made on application of the Equitable Trust Co., and other creditors. The Pusey & Jones Co. was not put into bankruptcy, as it was considered a going concern at the time of the appointment of the Hannevig receiver. The creditors being informed that the concern owed comparatively little money elected as chairman of the board of directors, Major Wise, who with Charles E. Hughes Jr., placed before the shipping board the Pusey & Jones Co.'s claim for \$14,000,000, on contract, covering emergency shipbuilding during the war. It was at this time that Mr. Hansen obtained the appointment of the Delaware receiver.

On April 3, twenty-four delegates representing ports from Hampton Roads to Portland, Me., met at the Maritime exchange in New York and approved plans for a permanent body to be known as the North Atlantic Port association. The new body will take action on matters of common interest to commerce and shipping along the coast. Suggestions were made that effective work could be done by the new body by encouraging shipments through North Atlantic ports, to offset the tendency in recent years of the fast growing trade of Montreal.

Figures completed for the first three months of 1923 show a total of 1,101,327 tons of imported merchandise landed at Boston which compares favorably with the 614,493-ton total for the same period in 1922. This tonnage of merchandise this year arrived in 359 steamers. Exports for this same period show a decrease and amounted to 95,000 tons against 133,230 tons for 1922.

The MAJESTIC, largest ship in the world, arrived in New York in March, having steered her first trip by gyroscope compass. She is equipped with two gyrocompasses with auxiliary steering repeaters, bearing repeaters, course recorder and radio direction finder repeater, supplied by the Sperry Gyroscope Co., New York.

Contract has been awarded to the Noank shipyard, Noank, Conn., for a large barge for the United States government for use by the engineering department at Philadelphia.

C. H. Sprague & Son have purchased the steamer PLYMOUTH from the bankrupt Green Star line. She is 9500 gross tons, built at Camden, N. J., in 1915, and has been laid up for over a year.

The Atlantic Works, East Boston, Mass., has bought from the shipping board the 6000-ton floating drydock of the board at Brooklyn, N. Y. Space is being made for the new dock at the plant of the Atlantic Works. The dock will be towed to Boston from New York shortly.

John A. Hull & Co., weighers and samplers, have moved their offices from 65 High street to 717 Atlantic avenue, Boston.

The Scandinavian-American line steamer HELLIG OLAV is scheduled to sail from Boston on May 11 for Scandinavian ports.

Along the Gulf Coast

HUMBLE OIL & REFINING CO.'S tanker, BAYTOWN, after being tied up for 18 months was brought from Houston to Galveston in March for repairs and inspection. The Atlas Engineering Co. of Galveston was the successful bidder, taking the job for \$6380, the work to be completed in 10 days. The placing of this vessel in service leaves little tonnage idle in the Galveston district.

Funds were provided in the general rivers and harbors bill for widening Galveston channel to its projected width of 1200 feet. For some time past the channel has been maintained at 800 feet in width and 30 feet in depth because of limited funds. The increased width will extend deep water to the dike so that industries can be established there and will also facilitate the handling of ships in and out of the harbor.

Clyde F. Trotter, formerly of New Orleans, has opened an office in Galveston for the purpose of establishing a plant quarantine inspection service under the federal horticultural board. All stores and cargoes consisting of plants, vegetables, and fruits, taken aboard vessels in foreign ports are subjected to a close inspection and if found to be infected with insect pests or plant diseases are ordered destroyed.

The Norwegian bark VISTON was towed to Pensacola, Fla., in March by the tug, MESSENGER, in order that she might secure her cargo in the time specified in her charter party.

Since the passage of the rivers and harbors bill, work of assembling material for constructing the east end seawall extension at Galveston is going forward. Several contracts for stone, piling, reinforcement bars, sand and cement have been awarded. T. W. Forman, junior engineer, will be in charge of construction.

J. G. Johnson, New York marine superintendent of the Sinclair Navigation Co., was in Galveston in March in connection with repairs to the Sinclair tanker, WM. BOYCE THOMPSON. The vessel recently grounded south of Tampico and suffered the loss of her rudder post and damage to her bottom.

The Tampa InterOcean Steamship Co. was recently allocated the shipping board vessel VOLUNTEER of 11,000 tons deadweight for the Far Eastern trade. The VOLUNTEER is the second electrically driven vessel operated by this company and will substitute for the PATRICK HENRY which grounded off Honolulu and had to put into that port for repairs.

Anderson Clayton & Co., Houston, Tex., have announced the award of two contracts. One went to J. B. Townsend for constructing a new shipside warehouse and compress at a cost of \$540,000

and the other to Thomas Tellepsen for constructing a concrete wharf 1500 feet long on the Houston ship channel adjacent to and to be used in connection with the warehouse and compress. Anderson, Clayton & Co. are large cotton factors and export large quantities of cotton each season.

Actual construction work has started on the refinery of the Texas Sugar Refinery Co. at Texas City.

The Gulf Refining Co.'s tanker WINIFRED reported by wireless in March from a point about opposite Brownsville, Tex., that her steering gear was disabled. The company's tug, ROBERT P. CLARK, was dispatched from Galveston to her assistance and both made Galveston. Temporary repairs were made so as to allow the tanker to proceed to Houston to discharge her cargo. The WINIFRED was five days overdue from Tampico.

Joseph Redfern former master of the vessel NISHMAHA, was bound over to the federal grand jury on the charge of having violated the Harrison narcotic act. The NISHMAHA came into the roads at Galveston from Bremen, Germany, on Feb. 28 and on the morning of March 1 seven large cases (each weighing about 100 pounds) of liquid morphine were found hidden among the rocks of the south jetty. This is the largest quantity of narcotics ever seized there by the customs authorities and each case showed that it was of German origin.

Business conditions in the West Indies are fast becoming normal according to Joseph A. Torregrossa, assistant traffic manager of the Lone Star Steamship Co., who returned to Galveston in March on the company's vessel, SOUTHSEAS. The increased price of sugar is helping Cuba and Porto Rico to such an extent that they are taking more American products. Porto Rican fruit growers are experimenting with a specially prepared paraffin wax with which they cover grapefruit and oranges for shipment to the United States in ordinary cargo vessels. This wax is said to be giving good results in keeping the fruit from decaying for several months.

The four-masted barkentine FREDERICK A. DUGGAN, which was built at Bath, Me., 21 years ago, was sold at auction in Houston, Tex., in March, for \$200. She had been libeled for sums aggregating approximately \$15,000. Jules Block, Galveston, the purchaser, will break her up for salvage.

Colonel Hoffman, United States district engineer located at New Orleans, has been authorized by General Lansing H. Beach to survey the interoceanic canal from the Mississippi near New Orleans to Corpus Christi, Tex. Upon the report of this survey will be determined whether or not the canal will

be completed and made a part of the Mississippi waterway system.

* * *

The new sulphur loading plant of the Texas Gulf Sulphur Co. at Galveston was operated for the first time on Feb. 28 when the American motorship, GLEN-DARUEL, was given a cargo of 3500 tons of sulphur. The new plant takes the place of a wooden constructed plant that was destroyed by fire two years ago. It consists of two concrete bins 600 feet

long and having a combined capacity of 35,000 tons, a belt conveyor and traveling hoists. Six hundred tons of sulphur can be loaded into a ship's hold in an hour.

* * *

"Captain" Maud E. Griffin, master of the tug boat NEW BRUNSWICK and the only woman in Texas who holds a pilots license was in Galveston recently to have her license renewed. Mrs. Griffin and her husband were unable five years ago to secure a pilot for their vessel so

she took out a license. She acts as pilot while her husband is the engineer.

* * *

According to data released by the shipping board covering the tonnage of vessels entered and cleared direct in the foreign trade during the fiscal year ended June 30, 1922, Galveston ranked sixth with 3,790,818 tons. New York, New Orleans, Baltimore, Philadelphia, and Port Arthur, in the order named, had larger tonnage movements in foreign trade.

Up and Down the Pacific Coast

AT THE port of Tacoma recently, 16,000,000 feet of lumber were in storage awaiting shipment to all parts of the world. The movement of cargo over Tacoma's municipal piers is so great that the public properties are reported to be making a splendid profit. At this terminal, installation of a mono-rail freight handling system is being completed.

* * *

Following the granting of a \$10 monthly wage advance to sailors on coasting vessels on the north Pacific, deck officers are planning a campaign for higher wages. It is understood that efforts to obtain this increase by June 1 are under way.

* * *

The port of Seattle has decided to install additional automatic cargo handling devices. One machine, now on trial, is a telescopic cargo conveyor, costing \$3500. If this proves successful it will be placed in all public terminals in the port.

* * *

Settlement of a threatened strike of longshoremen at Vancouver, B. C., has been effected. The men were granted an extra hour's pay for standing by time and other working concessions.

* * *

Pumping operations on the sunken wreck of the British steamer WELSH PRINCE, near the mouth of the Columbia river, have proved unsuccessful because of heavy cargo inside the hull. Arrangements have now been made for the construction of a cofferdam around the wreck and this method is expected to result in the removal of the wreck before September when the contractor's time expires.

* * *

The shipping board's steel steamer WALLINGFORD, which has been out of service at Seattle for nearly two years, has been purchased by the McCormick Steamship line and will be used in the intercoastal lumber trade.

* * *

North Pacific lumber shippers are interested in the increased movement of lumber and logs from Siberia to Japan, which is reported to be assuming a large volume.

* * *

Bids for purchase of the wrecks of the steamers SANTA RITE and TUSCAN PRINCE, lost off Vancouver island in February, have been rejected by the underwriters. Further tenders will be in-

vited in the near future. From the TUSCAN PRINCE 630 cases of Belgian window glass were salvaged.

* * *

The government cable steamer DELLWOOD, which recently replaced the obsolete BURNSIDE, has been engaged in repair work on the Alaska cable. Government officials plan to send the DELLWOOD to the Atlantic during the year to load 1000 miles of new cable to be laid between Seattle and Sitka. The BURNSIDE is to be sold in the near future.

* * *

Purchase of the old Skinner & Eddy shipyard, No. 2, Seattle, by the port of Seattle, will be submitted to the voters May 8. The port has offered \$600,000 for the site to the shipping board, and if authority is granted intends to erect a modern terminal and immigration station.

* * *

The Pacific Northwest Terminal Tariff bureau has been organized for the purpose of fixing and maintaining uniform practices and rates at ports in Washington and Oregon. Both private and publicly owned terminals are eligible to membership.

* * *

The Canadian Pacific announces that in future it will eliminate the call at Manila by its transpacific lines. No explanation was given for this action, although in shipping circles it is understood that the service being given the Philippines by American vessels influenced the British line in arriving at this decision.

* * *

Purchased by Portland interests, the American steel steamer PETER KERR, formerly the shipping board freighter EASTERN SAILOR, has entered service on the intercoastal route. It is reported that Portland capitalists intend to purchase additional tonnage with the intention of operating an entire fleet owned in Portland.

* * *

Shipping companies operating on the intercoastal route are reported to be favorably considering reorganization of the conference which was disrupted last June by a rate war. Since then open rates have prevailed. According to present intentions, the new conference will become effective about July 1 next. Some rate increases are contemplated.

* * *

With only 45 minutes to spare, the British steamer GREAT CITY saved her

grain charter. The vessel was chartered several months ago when rates were much higher, and every effort was made to get her in position to load, as the difference in rates amounted to about \$25,000. The GREAT CITY loaded 10,000 tons of grain for United Kingdom at Vancouver, B. C.

* * *

Increased movement of freight by water has resulted in a 600-foot extension to the terminals of the Tacoma smelter, where new ore handling devices have also been installed.

* * *

A modern fumigating plant has been installed at Terminal No. 4, Portland. Its capacity is 1000 bales of cotton daily.

* * *

The famous battleship OREGON, now out of commission, will be turned over by the navy to the state of Oregon. It is planned to station the historic fighting ship in Portland harbor as a permanent exhibit. The vessel is now at the Puget Sound navy yard.

* * *

At the port of Seattle a new system of pipe lines has been installed to facilitate the pumping of bulk oils from ship to tanks or tank cars, upon arrival from the Orient. Wood and vegetable oils are beginning to move again in considerable volume.

* * *

The Willamette Iron & Steel Works has constructed a locomotive erecting shed on property of the port of Portland. This firm is busily engaged in several large steel contracts, including considerable marine repair work.

* * *

Reports from Japan indicate improved shipping conditions. Late advices state that many shipowners have been able to pay off mortgage obligations and free their tonnage. Numerous vessels, recently idle, are again in commission.

* * *

Port of Portland charges for placing pilots aboard vessels outside of the mouth of the Columbia river have been increased from \$10 to \$30 a trip. The change was made on the grounds that the port has been losing \$20 a trip. Plans for a proposed pilot boat have been abandoned, it is announced, because the pilotage question is so involved that it was deemed inadvisable to make the contemplated move.

Equipment Used Afloat, Ashore

Flexible Couplings for Marine Auxiliaries—Change Pump Valve
Design—Practical Marine Valves—Self-Fitting Keys—Rivet Carrier

DIRECT connection between the shaft of the driving machine and that of the driven machine is a universal condition in ship board today in at least some of the auxiliaries. In the ordinary typical cargo ship, with steam

together by the use of flexible pins instead of rigid bolts. These flexible pins are made up of a number of thin flat steel springs held in keepers by means of dowels so that movement is permitted radially as well as trans-

versely. When assembled is flexible in all directions. Fig. 4 shows sectionally a marine type coupling.

By the use of flexible couplings, therefore, unavoidable errors in alignment are compensated for and bearing and shaft troubles are overcome. Each laminated pin carries its part of the transmission load allowing for misalignment, and at the same time serving to absorb and cushion sudden shocks. When the shafts which the coupling is intended to connect, are at an angle, the bundle of flat springs making up each individual pin slides in the respective keepers while some of the intermediate pins also bend, thus allowing a sufficient movement of one flange in respect to the other to allow each shaft to run freely on its own true center. For endwise error only, in setting up, all of the pins (bundle of springs) move in their keepers until this amount is compensated for. When the two shafts are out of center though parallel to each other, the correction by means of the flexible coupling is effected as the top and bottom laminated pins pivot about the dowel pins through the keepers, while some of the laminated pins in the center bend slightly, each shaft finding and running independently in its own centers without strain.

Even though it is intended to install a flexible coupling between two direct-connected machines, the alignment of the two shafts should be done with care. For ordinary accuracy this can be done by using a steel straight edge across the machined flanges of the coupling. It is, of course, evident that two bearings, but not more than two, can be made self-aligning by means of the flexible coupling and that unavoidable errors in setting up will be overcome. Allowing for the greatest care in original alignment of two connected

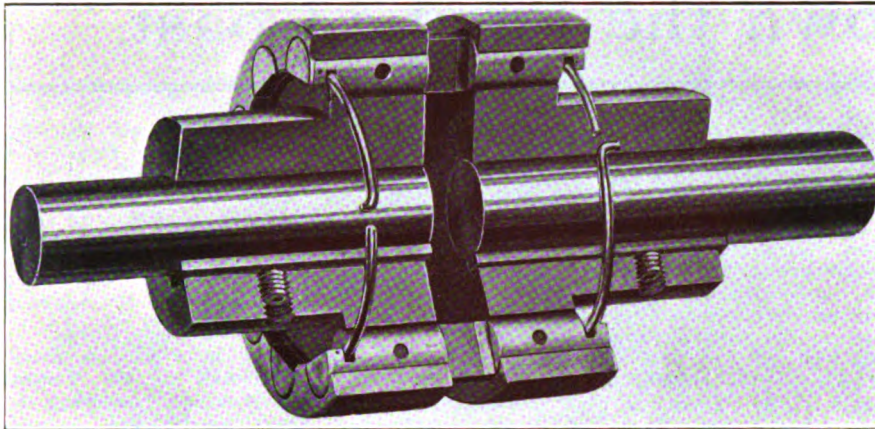


FIG. 1—FLEXIBLE COUPLING FOR HEAVY DUTY

boilers and a reciprocating engine for main drive, the following auxiliaries are directly connected in the manner indicated above, blowers, generating sets, refrigerating machines, centrifugal circulating pumps and in some instances condensate pumps. With the already considerable application of electricity for individual auxiliary drive and the growing use of this type of drive alone and its use with diesel engines for main drive both for the conversion of existing ships and in new ships, it is evident that the direct drive for all auxiliaries will gradually become a customary method.

The present use of direct connection and the very evident future trend in this direction therefore would seem to make the description of a type of flexible coupling for use in connecting the respective shafts of the driving and driven machine of timely interest. Even under the most favorable conditions and the use of care and skill in alignment, a rigid coupling between direct-connected machines will set up unnecessary strains, increase friction and cause rapid wear.

The accompanying illustration, Fig. 1, shows in section a flexible coupling made by the Francke Co., for which Smith & Serrel, Central avenue and Halsey street, Newark, N. J., are the distributors. This coupling is made up of two flanges, either cast iron or steel, joined to-

gether by the use of flexible pins instead of rigid bolts. These flexible pins are made up of a number of thin flat steel springs held in keepers by means of dowels so that movement is permitted radially as well as trans-

versely. Spring retainer rings lock the flexible pins in the flanges and hold them from turning. In the larger size, they are bolted in place to prevent movement or wear on the flanges.

Figs. 2 and 3 illustrate the individual pins. As the individual pin by

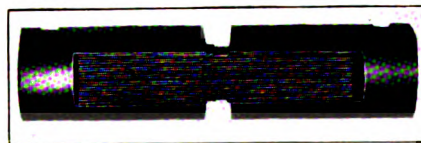


FIG. 2—FLEXIBLE PIN UNITS ASSEMBLED

its method of construction allows motion in three directions, viz; transversely by bending in the flat springs, in a radial direction by the elongated hole for the dowel pins and in a direction at an angle to the line of rotation of one of the connected units by means of pivoting about the dowel

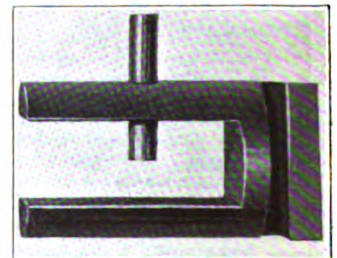
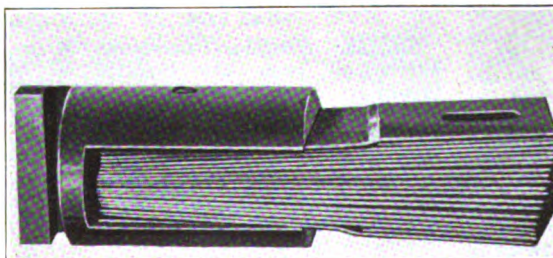


FIG. 3—PIN UNITS APART TO SHOW CONSTRUCTION

shafts, some uneven setting of foundations, or movement of the supporting frames, heat expansion, vibratory movement or the wearing of one set of bearings more quickly than the others will in time after the machines are placed in operation inevitably cause a certain degree of misalignment, which can be taken care of by using the flexible coupling. A rigid connection in a case of this kind will cause hot bearings, scored or broken shafts, undue wear broken shafts or damage to the machines connected. The absorption and cushioning of shocks in the transmission of power from the driving to the driven machine is of the greatest importance in relieving the impact due to absolute rigidity.

The flexible coupling is made in a great many sizes suitable for all manner of direct-connected drives, light duty from $2/3$ horsepower per 100 revolutions per minute, to $13\frac{1}{4}$ horsepower per 100 revolutions per minute, and heavy duty, from $1\frac{1}{3}$ horsepower per 100 revolutions per minute to 3200 horsepower per 100 revolutions per minute ranging from $5/8$ -inch diameter bore to $13\frac{1}{4}$ -inch diameter bore.

A typical motor driven centrifugal pump installation is shown in Fig. 5 where the shafts of the driving and driven machine are connected with the flexible coupling. To reduce friction and prevent excessive wear and strain, absorb shocks and minimize vibration the use of a flexible coupling for which the claims set forth above can be substantiated, would be of great importance in direct-connected machinery on board ship.

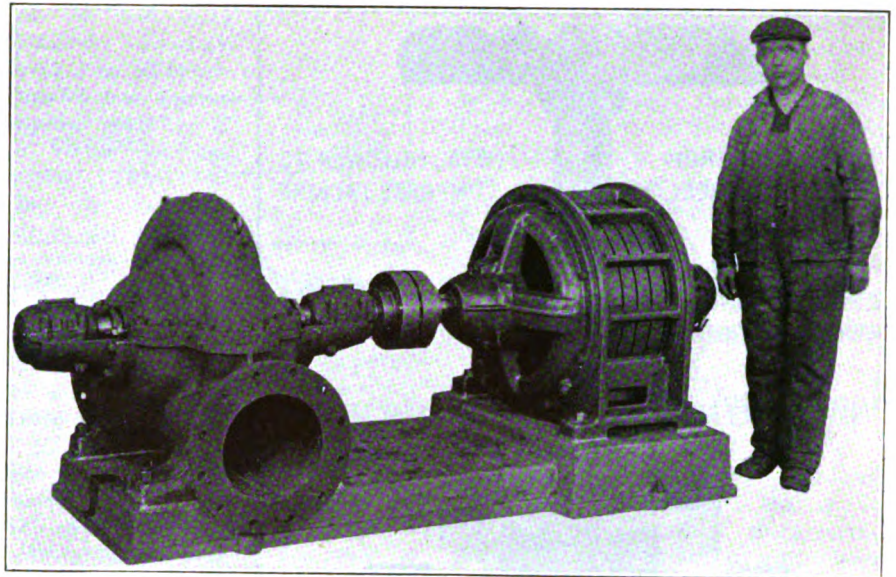
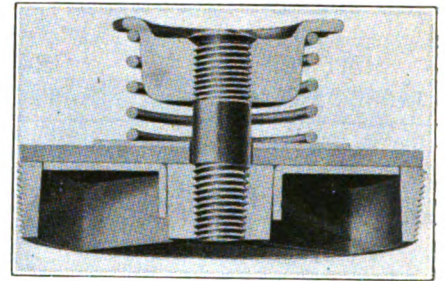


FIG. 5—COUPLING ON TYPICAL MOTOR DRIVEN CENTRIFUGAL PUMP INSTALLATION

Introduce Changes in Pump Valve Design

Because of the rapid wearing of pump valves, the Worthington Pump & Machinery Corp., 115 Broadway, New York, has recently developed a new type of valve. A sectional view of the new device is shown in the accompanying illustration. It is claimed that since the rubber used is flexible and will always seat both at the hub and outer rim, the new valve assures absolute tightness when closed. The valve is constructed without screws, bolts, rubber rings, nuts, bushings and rotating elements. One of the features is the bottom plate, which is a middle seat for the rubber valve proper. When the

valve is closed, this middle seat carries the entire load and prevents the rubber seal from cutting on the seats and ribs. This bottom plate moves up and down with the rubber and assists in



SECTIONAL VIEW OF VALVE WHICH HAS PROTECTION FOR RUBBER

keeping the rubber valve in shape even when open. The rubber seal is protected by a backing plate which tends to keep the seat flat and prevent wear from contact with the spring.

A duplicate of the sandsucker AMERICAN has been ordered from the Sturgeon Bay, Wis., Dry Dock Co. by the Lakes Sand Co., a subsidiary of the Great Lakes Dredge & Dock Co. It will cost about \$250,000, will have a steel hull and will be equipped with self-loading apparatus. The ship will be 150 feet long, with a beam of 40 feet and a depth of 15 feet, holding 900 cubic yards. The contract calls for completion this year.

Of the 104 German ships seized by this government at the entrance of the United States in the world war, the shipping board has disposed by sale or transfer of 44; the navy has sold 3; 11 have been lost at sea; 30 remain under control of the shipping board; 14 under control of the navy, and 2 were returned to the American owners.

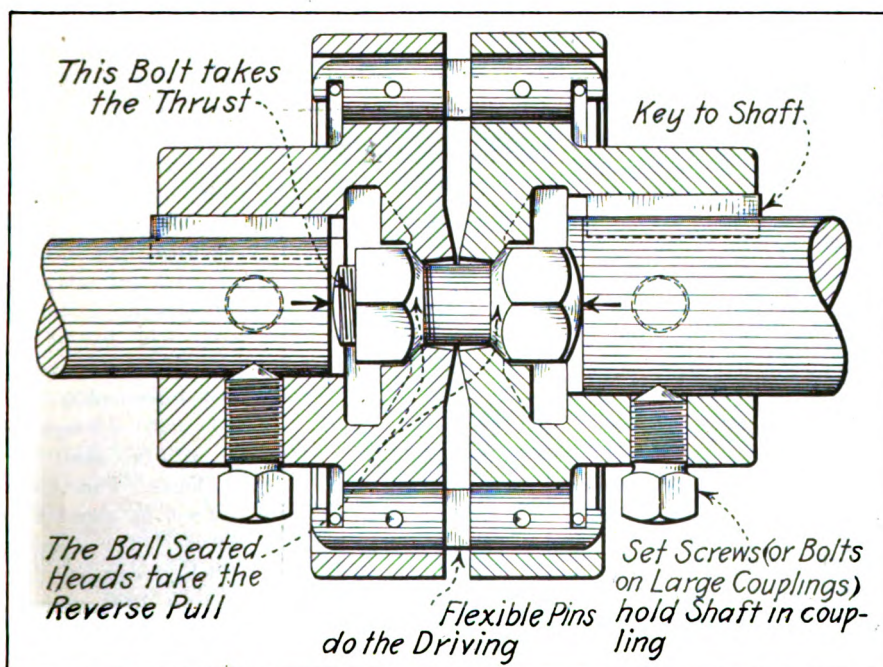
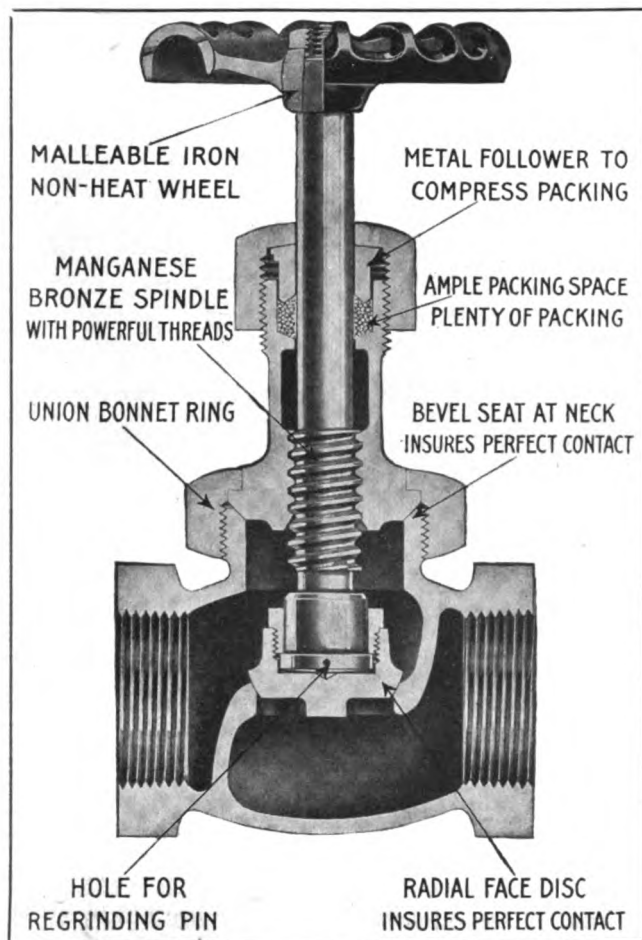


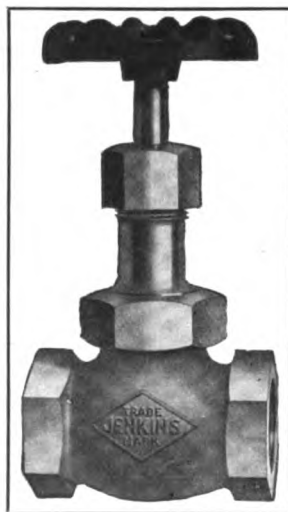
FIG. 4—SECTIONAL VIEW OF MARINE TYPE COUPLING



CROSS SECTION OF THE GLOBE PATTERN MARINE TYPE REGRINDING VALVE

Marine Valves Built for Practical Pressures

In considering valves for marine use, it may be well to note that in no other line of equipment is the universal average of excellence in material, design and workmanship higher. Good valves may be obtained from any one of several concerns of long experience and high standing. The complete dependence of all industrial enterprises and marine plants upon this product is readily recognized when it is considered that wherever pipe is used valves of one sort or another are necessary. The stress laid on quality should increase directly with the severity of the service. Where, high and varying pressures and temperatures, expansion and contraction, stresses set up due to weight of piping and settling, and corrosive action due to the medium transmitted, are experienced, it is ob-



MARINE TYPE OF GLOBE VALVE

vious that the best valves obtainable should be used. Great expense and difficulty in effecting repairs and the safety of life under certain conditions also demand the use of the best. On account of complete isolation while at sea from all contact with the elaborate repair facilities near at hand for industrial or power plants on shore, it is clear that valves used for marine purposes particularly should have the greatest guarantee of simplicity and strength and that any trouble which may be experienced should only be of such a nature that repairs may be effected in service. The regrinding marine valve shown in the accompanying illustration is a new line recently added to their regular line by Jenkins Bros., New York. In mak-

ing up this marine valve, the manufacturers have drawn on their long experience and have spent a great deal of time in careful design, experiments, extraordinary tests and actual service tests to perfect the product before placing it on the market.

The valves are made of selected bronze and all parts are subjected to careful inspection during each step in manufacture. A working steam pressure of 225 pounds and a maximum temperature of 500 degrees was decided on after careful study of the needs of marine service, in order to give full strength and yet not exceed the usual requirements. By so doing the cost of manufacture is maintained at a minimum for a quality valve. Almost all marine plant steam pressures are in excess of 150 pounds and hardly any exceed 225 pounds working steam pressure. In testing

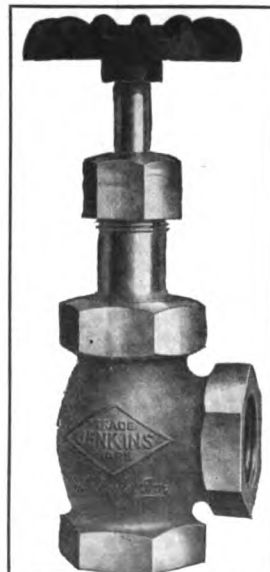
these valves, they are subjected to a hydrostatic pressure of $2\frac{1}{2}$ times the working pressure or 575 pounds. A regular steam pressure test of 180 to 190 pounds is applied to each valve. As an extreme test, 3000 pounds hydrostatic pressure has been used without resulting in distortion or distress.

The valves are suitable for air, gas, oil, water or steam and are built in globe, angle and cross patterns, in all pipe sizes from $\frac{1}{4}$ -inch to 3 inches inclusive, and are furnished with either screwed or flanged ends. The sizes $2\frac{1}{2}$ and 3 inches are fitted with either union bonnets or bolted yoke type bonnets. All parts are made to limit gages and are interchangeable. When closely adhered to, this practice means that new parts will fit and may be replaced easily and economically.

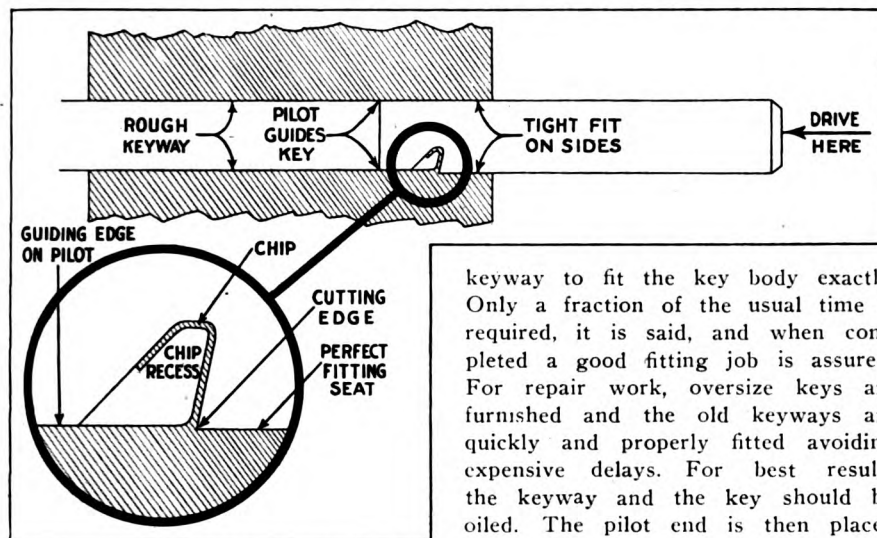
Some of the outstanding features of the design is the elimination of straight lines and sharp corners, sturdy construction, good proportions and correct distribution of the metal. There is an extra long spindle thread bearing in bonnet. The spindle has a beveled shoulder which fits into a seat in the bonnet, shutting off steam or water so that the stuffing box may be repacked. In packing it is not necessary to remove the wheel. A molded woven asbestos saturated in oil and graphite is used for packing. This packing comes in the form of split rings suitable for the different sizes of valves and can be carried as spares. The pipe ends are tapped with the standard pipe taper. These valves can also be made of hard bronze suitable for superheated steam at a maximum working pressure of 225 pounds and a total temperature of 700 degrees Fahr.

Armstrong, Whitworth & Co., of Newcastle-on-Tyne have secured from the Swedish-American line an order for the largest passenger ship in the world to

be driven by motor engine. The engines, however, are to be built in Scandinavia, the order having been entrusted to Burmeister and Wain, Copenhagen. The engines will be of a new type, the twin screws developing 13,500 shaft horsepower with a speed of 17 knots. The total cost will be about £1,000,000. The vessel will have capacity for at least 1000 passengers between Gothenburg and New York. This route is of growing importance.



MARINE TYPE OF ANGLE VALVE



SECTIONAL VIEW OF SELF-FITTING KEY IN ACTUAL OPERATION

Self-Fitting Keys for Marine Use

Whenever a pulley, a hubbed flange or a coupling is fitted to a shaft except for light duty and small work, it is usual and good practice to key the two parts together in place of or in addition to using a set screw or dowel pin. To fit a key in the ordinary manner, the pulley or flange and the shaft are slotted so that the combined depth and/or width of the slot when the two parts are brought in line is slightly less than the corresponding depth and width of the steel key to be used. This is done so that by gradually enlarging the slot or reducing the size of the key by filing, a close properly tight driving fit may be made. Fitting a key into a keyway in this manner is slow and laborious.

An ingenious method has recently been developed by which the key makes and fits its own seat by having it cut out from 0.003 inch to 0.010 inch from the roughed out slot. The accompanying illustration shows one of these keys, with a cutting edge on one side only, in actual operation. Smith & Serrell, Central avenue, at Halsey street, Newark, N. J., are the distributors for this self-fitting key. Sizes manufactured are from 3/16 x 3/16 inch to 3 1/2 x 2 inches.

The key way is rough slotted in the usual manner and size for the ordinary key. Self-fitting keys are ground several thousandths of an inch wider than the regular rough keyway width, excepting a short portion of the entering end which is a few thousandths less, allowing it to readily enter the keyway. A hardened and ground cutting edge with a chip recess just in front, cuts the

keyway to fit the key body exactly. Only a fraction of the usual time is required, it is said, and when completed a good fitting job is assured. For repair work, oversize keys are furnished and the old keyways are quickly and properly fitted avoiding expensive delays. For best results the keyway and the key should be oiled. The pilot end is then placed in the keyway and taking care to hold the key straight the end of the key is tapped lightly to start and then driven home, the cutting edge of the key chipping its way in. Removal is accomplished in the same manner as for the ordinary key. On account of the hardened head, there is no danger of upsetting in driving it out. For a heavy drive fit, the key cutting edge may be stoned so that the key at this point will be from 0.001 inch to 0.003 inch narrower than the body.

On shipboard, fitting a key in practically any piece of machinery is nearly always an emergency job which must be completed in the quickest possible time. It is consequently of interest to present this new method.

Passes Rivets Through Flexible Tubing

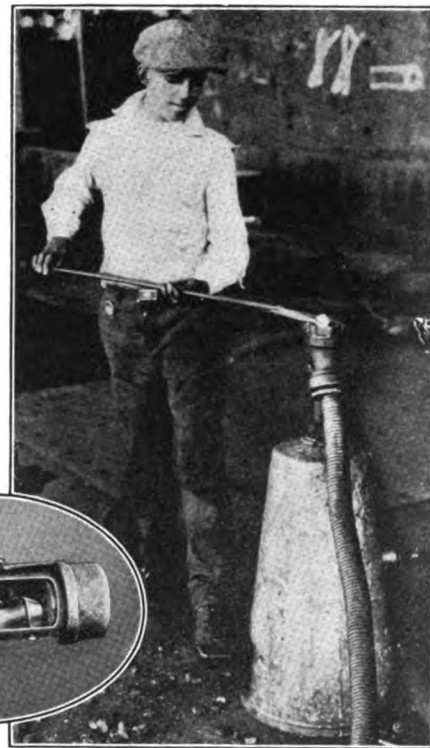
Displacing the usual methods of passing rivets in shipbuilding is a machine developed for this purpose. Through the fact that by its use gas and fumes are eliminated in holds of ships the device may prove beneficial in doing away with one great cause of discontent and unnecessary delays in shipbuilding schedules. The device and the forge for heating the rivets

are conveniently located and tubing is led to the job. As each rivet is heated and ready to be passed it is set by the heater on a valve provided in an opening contained in the head of the gun. The rivet opens this valve by its own weight and enters the machine. The valve closes automatically and, by pressing on a foot treadle, compressed air in the tank sends the rivet into the receiver at the other end of the flexible

tubing. A standard machine has distance capacity of 125 feet and it is claimed that it will deliver rivets up or down at 50 feet every three seconds. There is also claimed to be no change in the temperature of the rivets. The corrugations of the tubing act as a tumbling barrel and all hard oxide is removed as the rivet passes through. The device is manufactured by the Pennsylvania Flexible Metallic Tubing Co., Broad and Race streets, Philadelphia.

Unite to Seek Theft Proof Container

The development of a standardized theft-proof container is the work that has been assigned to a committee of British exporters with whom marine insurance underwriters are co-operating. The committee, which is carrying on its work in London under the patronage of the London chamber of commerce, is asking associate organizations to co-operate and models of containers have been sent from the United States, New Zealand and numerous other countries. A container along the lines sought has been submitted by a New Zealand concern.



COMPRESSED AIR CARRIER FOR HANDLING HOT RIVETS 17 FEET PER SECOND

This can only be opened at the top, being secured in such a manner that any attempt at penetration will be discovered. The lid is hinged and when closed is held in place by two screws that are well secured.

Business News for the Marine Trade

CAPITALIZED at \$250,000 the Booras Steamship Navigation Co., New York, recently was incorporated to engage in navigation, trade, commerce, etc. It can be reached at 276 Fifth avenue, New York city.

The Meacham & Babcock Shipbuilding Co., Seattle, recently was incorporated with a capital stock of \$300,000.

With a capital stock of \$201,000, the Gulf Coast Marine Supply Co., Galveston, Tex., recently was incorporated.

To build, own and operate boats, the Malston Co., Inc., recently was incorporated at Dover, Del., with a capital stock of \$800,000.

Under Delaware laws, the Pocahontas Steamship Co., recently was incorporated to build, own and operate boats of all kinds. It is capitalized at \$500,000.

Peck's Sightseeing Boats have been incorporated at Jacksonville, Fla., by Richard Peck and John Holden Jr.

Capitalized at \$50,000 the Verplanck & Tompkins Cove Ferry Co., Verplanck N. Y., recently was incorporated by G. R. Bleakley and F. A. Burchetra. The company is represented by Attorney J. Wolf, 1089 Eastern Parkway, Brooklyn, N. Y.

The Fort Myers Steamship Co., Ft. Myers, Fla., recently was incorporated with a capital stock of \$100,000 by J. W. Riggs, Harry Botts and others.

Chiarello Stevedoring Co., New York, recently was incorporated with a capital stock of \$5000 by S. Guardino, P. Rinelli, 160 Broadway, New York, and others.

Capitalized at \$500,000 the Sagimo Steamship Corp., recently was incorporated under the laws of Delaware. It is represented by the Corporation Trust Co. of America.

Canadian American Bureau of Trade, New York, has been incorporated to act as shipping agent with a capital stock of \$20,000, by E. B. Bechan, D. W. Harris and T. R. Fleming. The company is represented by S. Graham, attorney, 31 Nassau street, New York city.

The Fulton Steamship Corp has been incorporated under the laws of Delaware

with a capital stock of \$100,000. It maintains offices at 24 Water street, New York. Officers of the company are: President, F. H. Jaer and vice president, Charles J. Brockstedt.

With a capital stock of \$1,608,000 the Redmin Steamship Corp., recently was incorporated under the laws of Delaware. It is represented by the Corporation Trust Co. of America.

The Red Bird Steamship Corp., has been incorporated under the laws of Delaware. The company is represented by the Corporation Trust Co. of America.

The Newport News Shipbuilding & Drydock Co. has been awarded the contract for constructing 200 wooden top gondola cars for the Seaboard Air Line railway.

Manufacture of steel pipe has been resumed at the plant of the Merchants' Shipbuilding Co., Chester, Pa. It is understood the company has received an order for 5000 tons to be used in the New York water supply project.

The Superior Transportation Co., New York, has been chartered to engage in the navigation business with a capital stock of \$50,000. Incorporators of the company are L. J. Lake, J. E. Lee and A. M. Hull.

Dock enlargements are to be made at the Charles P. McCormick Co.'s plant at St. Helens, Oreg., in order to care for the increasing steamship traffic.

A shipyard will be established at New Orleans within a few months by the Todd Shipyard Corp., it is understood. The plant will include shipbuilding, drydock and repair facilities, and will represent an investment of about \$3,000,000.

The 2000-ton drydock operated by the Columbia River Drydock Engineering & Construction Co., Portland, Oreg., has been sold to J. L. McLain and Otis Cuting, Seattle.

The Atlantic Works, Boston, has bought the 6000-ton steel floating drydock built by the Ramberg Drydock & Repair Co. It will be towed from Brooklyn to Boston shortly.

The Universal Steamship Corp. recently was incorporated under the laws of

Delaware with a capital stock of \$100,000.

The American Export Corp., New York, recently increased its capital stock from \$25,000 to \$100,000.

Capitalized at \$1,800,000, the Colombian Steamship Corp., recently was incorporated under the laws of Delaware.

The Olympus Steamship Corp., New York, recently was incorporated with a capital stock of \$10,000, by W. S. Auld, J. J. Binder and S. Brander.

Capitalized at \$50,000 the Algerian-American Shipping Co. recently was incorporated under the laws of New York by George H. Haynor Jr., E. Jones and W. D. Greenless.

John J. Lenahan, Buffalo, has become associated with the Cowles Towing Co., Buffalo, and the company has been reorganized at the Cowles' Towing Line, Inc., with a capital stock of \$50,000. The new company will take over the steel and wooden tugs, derrick boats, lighters and wrecking equipment of the old organization. The business will be expanded, it is understood.

The Planet Line, New York, has been incorporated with \$50,000 capital stock under the laws of New York, by F. E. Baldwin, F. V. Barnes and R. F. Weeks.

Late Marine Patents

Copies of any one of these patents can be obtained by forwarding 25 cents in stamps to Siggers & Siggers, patent attorneys, National Union building, Washington, and mentioning MARINE REVIEW.

1442522—Braking device for vessels propelled by gas discharged below the water level, Henri A. Johannes de Bijn Nachenius, Haarlem, Netherlands.

1442543—Lightship beacon, Max Schuler, Neumuhlen, near Kiel, Germany, assignor to the firm Anschultz & Co., Neumuhlen, near Kiel, Germany.

1442623—Sail reefing mechanism for boats, Otto Linneman, Glen Cove, N. Y.

1442707—Ship stabilizer, John Solareczak, Perth Amboy, N. J., assignor of one-half to Stanislaus Midura, Perth Amboy, N. J.

1442729—Paddle wheel for boats and the like, John Henry Nyenhuis, Chicago.

1442744—Ship construction, George W. Thomas, Williamstown Beach, Victoria, Australia.

1442844—Marine propeller brake, Karl Alquist, New York.

1442982—Bilge tunnel for ships, George Simpson, Richmond, N. Y., and Johnston R. Gordon, New York, assignors to Simpson-Gordon Patents, Inc., New York.

1443121—Life saving device, Newell T. Fogg, Sanford, Me.

1444150—Ship stabilizer, Stanley Gadowski, Chicago.